NOTE: This order is nonprecedential.

United States Court of Appeals
for the Federal Circuit

DAVID NETZER,
Plaintiff-Appellant

v.

SHELL CHEMICAL LP, SHELL OIL COMPANY, SHELL OIL PRODUCTS COMPANY,
Defendants-Appellees

2018-2129

Appeal from the United States District Court for the Southern District of Texas in No. 3:18-cv-00075, Judge Lynn N. Hughes.

ON MOTION

PER CURIAM.

ORDER

(Filed Sep. 25, 2018)

Shell Chemical LP, Shell Oil Company, and Shell Oil Products Company LLC (collectively, "Shell") move to dismiss this appeal. David Netzer opposes the motion.

In 2014, Mr. Netzer, through counsel, filed a suit at the United States District Court for the Southern District of Texas, alleging Shell infringed his U.S. Patent No. 6,667,496. The district court granted summary judgment of noninfringement. Mr. Netzer appealed. We reviewed the district court's summary judgment decision *de novo* and affirmed. *See David Netzer Consulting Eng'r LLC v. Shell Oil Co.*, 824 F.3d 989 (Fed. Cir. 2016).

In April 2017, Mr. Netzer moved for reconsideration of the summary judgment under Federal Rule of Civil Procedure 60(b), arguing that he obtained new testimonial evidence by James Storm, a former technical expert of Shell. In May 2017, the district court denied the motion because "it was not filed within one year of final judgment." The district court judge further noted that "[t]he report prepared by Netzer's technician after final judgment is not newly discovered evidence. It is an opinion about existing data." Mr. Netzer attempted to appeal that decision to this court, but that appeal was dismissed as untimely. *David Netzer Consulting Eng'r LLC v. Shell Oil Co.*, No. 2017-2419 (Fed. Cir. Oct. 25, 2017).

In March 2018, Mr. Netzer, now acting pro se, filed a submission at the Southern District of Texas. In that submission and his subsequent motions, Mr. Netzer alleged that the district court should have recused in his prior suit against Shell under 28 U.S.C. § 455(a) because the district court judge was a member of the World Affairs Council of Houston and a significant donor, Shell was a sponsor of the Council, and officials from Shell and an attorney from the firm representing Shell were also members of the Council during the prior litigation. Mr. Netzer further argued that the trial judge made a "highly biased and prejudicial statement" in referring to Mr. Storm as "Netzer's technician." Mr. Netzer also moved again for reconsideration under Rule 60(b).

The district court denied Mr. Netzer's motion to recuse and motion for reconsideration. Mr. Netzer appealed to this court. Shell now moves to dismiss as frivolous. Shell argues that any assertion of error for the same alleged infringement as raised in the prior complaint is barred under the doctrine of res judicata. Shell also argues that Mr. Netzer's motion for reconsideration from the prior judgment was untimely and presents no appealable issue. Shell further argues that Mr. Netzer's motion for recusal is so factually and legally insufficient that his appeal should be deemed frivolous. Mr. Netzer responds that the district court committed several errors in previously granting summary judgment and reiterates his arguments that the trial judge should have recused.

We agree with Shell at least insofar as its position "is so clearly correct" that "no substantial question regarding the outcome of the appeal exists." *Joshua v. United States*, 17 F.3d 378, 380 (Fed. Cir. 1994) (stating standard for summary affirmance). The summary judgment ruling and initial denial of the motion for reconsideration for newly discovered evidence in this case are final and not subject to further review. We also see no error, let alone an abuse of discretion, on the part of the district court judge in rejecting Mr. Netzer's recusal arguments. *See Andrade v. Chojnacki*, 338 F.3d 448, 454 (5th Cir. 2003). Mr. Netzer clearly did not show that "if a reasonable man knew of all the circumstances, he would harbor doubts about the judge's impartiality." *Travelers Ins. Co. v. Liljeberg Enters., Inc.*, 38 F.3d 1404, 1408 (5th Cir. 1994) (internal quotation marks and citation omitted). Moreover, because we reviewed the summary judgment ruling *de novo*, Mr. Netzer received a fair, impartial review of the merits of the ruling, and thus little would be gained in vacating the final summary judgment even if his claims had any merit. *See Patterson v. Mobil Oil Corp.*, 335 F.3d 476, 485-86 (5th Cir. 2003).

Accordingly,

IT IS ORDERED THAT:

(1) The motion is granted to the extent that the judgment of the district court is summarily affirmed.

(2) All other pending motions are denied as moot.

(3) Each side to bear its own costs.

FOR THE COURT

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

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UNITED STATES DISTRICT COURT	SOUTHERN DISTRICT OF TEXAS

David Netzer,	§	
Plaintiff,	§	
versus	§	Civil Action G-18-75
	§	
Shell Chemical, LP, *et al.*,	§	
Defendants.	§	

Final Dismissal

(Filed Jun. 26, 2018)

David Netzer had the opportunity to present his case. This court heard it, and he appealed to the appellate and supreme courts. His so-called new evidence is a re-hash of his technician's opinion and an attack on the judge. He learned or could have learned everything there was to know about his patent case while it was pending.

This case is dismissed as *res judicata*.

Signed on June 26, 2018, at Houston, Texas.

/s/ Lynn N. Hughes
Lynn N. Hughes
United States District Judge

UNITED STATES DISTRICT COURT — SOUTHERN DISTRICT OF TEXAS

David Netzer, §
Plaintiff, §
§ Civil Action G-18-75
versus §
Shell Chemical, LP, *et al.*, §
Defendants. §

Order Denying Motion to Recuse

(Filed Jun. 21, 2018)

David Netzer's motion to recuse is denied.(25)

Signed on June 20, 2018, at Houston, Texas.

/s/ Lynn N. Hughes
Lynn N. Hughes
United States District Judge

United States District Court	Southern District of Texas

David Netzer Consulting Engineer, LLC, Plaintiff,	§ § §	
versus	§	Civil Action H-14-166
Shell Oil Company, *et al.*, Defendants.	§ § §	

Order on Reconsideration

(Filed May 16, 2017)

1. On March 31, 2016, the court entered the amended final judgment. On April 27, 2017, David Netzer Consulting Engineer, LLC, moved for reconsideration. Netzer is too late; the motion was not filed within one year of final judgment.[1]

2. The report prepared by Netzer's technician after final judgment is not newly discovered evidence. It is an opinion about existing data.[2]

3. Netzer's motion for reconsideration is denied. (64)
Signed on May 16, 2017, at Houston, Texas.

/s/ Lynn N. Hughes
Lynn N. Hughes
United States District Judge

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[1] Fed. R. Civ. P. 60(c).

[2] Fed. R. Civ. P. 60(b).

United States Court of Appeals
for the Federal Circuit

DAVID NETZER CONSULTING ENGINEER LLC,
Plaintiff-Appellant

v.

SHELL OIL COMPANY, Shell Chemical LP,
Shell Oil Products Company LLC,
Defendants-Appellees

2015-2086

Appeal from the United States District Court for the Southern District of Texas in No. 4:14-cv-00166, Judge Lynn N. Hughes.

Decided: May 27, 2016

ANTHONY MATTHEW GARZA, Charhon Callahan Robson & Garza, P.C., Dallas, TX, argued for plaintiff-appellant. Also represented by STEVEN CHASE CALLAHAN.

KATHLEEN M. SULLIVAN, Quinn Emanuel Urquhart & Sullivan, LLP, New York, NY, argued for defendants-appellees. Also represented by KEVIN ALEXANDER SMITH, San Francisco, CA; JOSHUA L. SOHN, Washington, DC; CHARLES BRUCE WALKER, JR., Norton Rose

Fulbright US LLP, Houston, TX; JAYME PARTRIDGE, Patterson & Sheridan LLP, Houston, TX.

Before PROST, *Chief Judge*, LOURIE and TARANTO, *Circuit Judges*.

LOURIE, *Circuit Judge*.

David Netzer Consulting Engineer LLC ("Netzer")[*] appeals from the decision of the United States District Court for the Southern District of Texas granting summary judgment of noninfringement of the asserted claims of U.S. Patent 6,677,496 ("the '496 patent"). *David Netzer Consulting Eng'r LLC v. Shell Oil Co.*, No. 4:14-cv-00166, ECF No. 45 (S.D. Tex. Aug. 26, 2015) ("*Decision*"). For the reasons that follow, we *affirm*.

BACKGROUND

Netzer owns the '496 patent, entitled "Process for the Coproduction of Benzene from Refinery Sources and Ethylene by Steam Cracking," which describes a process for the coproduction of ethylene and purified benzene from refinery mixtures. Claim 1, the sole independent claim, reads as follows:

> 1. A process for the coproduction of ethylene and purified benzene comprising:

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[*] As indicated *infra*, in March 2014, David Netzer Consulting Engineer LLC changed its name to David Netzer – Petrochemicals Consultant LLC.

> providing a first mixture comprising benzene, toluene, and one or more C_6 to C_7 non-aromatics;
>
> separating the majority of the benzene and the one or more C_6 to C_7 non-aromatics from the majority of the toluene to form a second mixture containing at least a portion of the benzene and at least a portion of the one or more C_6 to C_7 non-aromatics, wherein the second mixture is substantially free of hydrocarbons having more than nine carbons;
>
> introducing at least a portion of the second mixture to a cracker and thereafter cracking at least about 80% of the C_6 to C_7 non-aromatics in the portion of the second mixture that has been introduced to the cracker while maintaining essentially no cracking of benzene to produce a cracked product containing ethylene, propylene and *pyrolysis gasoline comprising olefins, di-olefins and benzene*; and
>
> *fractionating the pyrolysis gasoline to form a purified benzene product comprising at least about 80 wt % benzene.*

'496 patent col. 7 ll. 11–32 (emphases added).

The claimed process thus requires four steps: (1) providing a mixture containing benzene, toluene, and C_6–C_7 non-aromatic hydrocarbons; (2) separating most of the benzene and C_6–C_7 non-aromatic hydrocarbons from most of the toluene; (3) introducing the benzene-rich stream into a cracker, *i.e.*, a reactor that breaks down long-chain hydrocarbons to short-chain hydrocarbons, and then cracking the C_6–C_7 non-aromatic hydrocarbons to produce ethylene and pyrolysis gasoline; and (4) "fractionating the pyrolysis gasoline to form a purified benzene product comprising at least about 80 wt % of benzene" ("the fractionating step").

On January 23, 2014, David Netzer, the sole inventor of the '496 patent, assigned the patent to Netzer, a limited liability company newly formed under Texas law. J.A. 85 (assignment); J.A. 81–83 (Certificate of Filing issued by the Secretary of State). The next day, Netzer sued Shell Oil Company, Shell Chemical LP, and Shell Oil Products Company LLC (collectively, "Shell") in the United States District Court for the Southern District of Texas, alleging that Shell infringed the '496 patent. Shortly thereafter, the State of Texas requested that Netzer remove the word "Engineer" from its name. In March 2014, Netzer changed its name from David Netzer Consulting Engineer LLC to David Netzer – Petrochemicals Consultant LLC through a Certificate of Correction. J.A. 78–79, 87–88. Meanwhile, Shell answered and counterclaimed for a declaratory judgment of noninfringement and invalidity in the district court.

Shell then moved for summary judgment of noninfringement. Shell argued that the term "fractionating" should be construed to mean "conventional distillation, *i.e.*, separating compounds based on difference in their boiling points," which excludes extraction, *i.e.*, separating compounds based on solubility differences.

Shell argued that the patentee disclaimed extraction in the specification and prosecution history. According to Shell, its accused process does not meet the fractionating step because it uses extraction—more specifically, the Sulfolane process developed by Shell in the 1960s—to form a benzene product with 99.9% purity. Netzer responded that "fractionating" should be construed to mean "separating a chemical mixture into fractions, no matter the process units used." Examples of process units, according to Netzer, include distillation columns (for separating chemicals based on differences in boiling points), extractors (for separating chemicals based on solubility differences), and hydrotreaters (for hydrogenating unsaturated hydrocarbons, such as olefins). Netzer also argued that Shell infringes literally under either construction, and that Shell also infringes under the doctrine of equivalents.

The district court granted summary judgment of non-infringement. The court did not formally construe the claims, but, rather, implicitly agreed with Shell that "fractionating" does not include extraction. The court found no literal infringement, reasoning that "Netzer's method does not include extraction and does not yield benzene of 99.9% purity" and that "[t]o infringe, Shell would have to eliminate the extraction step and still produce benzene purified to at least 80%." *Decision* at 2. The court also found no infringement under the doctrine of equivalents because Netzer is barred by "specific exclusion, prosecution-history estoppel, and prior art." *Id.* at 3.

The district court then entered final judgment in favor of Shell. *David Netzer Consulting Eng'r LLC v. Shell Oil Co.*, No. 4:14-cv-00166, ECF No. 46 (S.D. Tex. Aug. 26, 2015). Netzer timely appealed to this court. However, because Shell's counterclaims remained pending in the district court, this court granted the parties' joint motion for a limited remand. On that limited remand, the district court dismissed Shell's declaratory judgment counterclaims without prejudice and then entered an amended final judgment, thus disposing of all claims and counterclaims. *David Netzer Consulting Eng'r LLC v. Shell Oil Co.*, No. 4:14-cv-00166, ECF No. 56 (S.D. Tex. Mar. 31, 2016). Netzer then filed a new notice of appeal, and its appeal was reinstated in this court. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

DISCUSSION

I

Before we reach the merits of Netzer's appeal, Netzer asks us to confirm that it has standing to maintain this action. According to Netzer, on January 24, 2014, at the inception of the lawsuit, an entity known as David Netzer Consulting Engineer LLC held enforceable title to the '496 patent pursuant to the January 23, 2014 assignment, and thus had standing to sue. Netzer argues that the March 2014 name change did not retroactively invalidate the January 2014 assignment under Texas law. The district court did not question Netzer's standing.

We agree with Netzer that it has standing to bring and maintain this action. At the inception of the lawsuit, the '496 patent was assigned to the plaintiff entity, then named David Netzer Consulting Engineer LLC. Although that entity later changed its name to David Netzer – Petrochemicals Consultant LLC as required by Texas law, that name change did not undo the January 23, 2014 transfer of patent ownership. The patent was owned by the same company, under its new name. We therefore conclude that Netzer, as the owner of the '496 patent as of January 24, 2014, has standing to maintain this action.

II

We turn now to the merits of Netzer's appeal. When reviewing a district court's grant of summary judgment, we apply the law of the regional circuit in which the district court sits, here, the law of the Fifth Circuit. *Teva Pharm. Indus. Ltd. v. AstraZeneca Pharm. LP*, 661 F.3d 1378, 1381 (Fed. Cir. 2011). The Fifth Circuit reviews a district court's summary judgment decision *de novo*, applying the same standard used by the district court. *United States v. Caremark, Inc.*, 634 F.3d 808, 814 (5th Cir. 2011). Summary judgment is appropriate when, drawing all justifiable inferences in the nonmovant's favor, "there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a); *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 247–48 (1986).

To determine infringement, a court first construes the scope and meaning of the asserted patent claims, and then compares the construed claims to the accused product or process. *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1129 (Fed. Cir. 2011). "The proper construction of a patent's claims is an issue of Federal Circuit law." *Id.* We review a district court's ultimate claim constructions *de novo* and any underlying factual determinations involving extrinsic evidence for clear error. *Teva Pharm. U.S.A., Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841–42 (2015).

Here, the district court did not make any factual findings to support any claim construction. *See* Appellant's Br. 21. Its claim construction was implicit in its decision of noninfringement. Because the intrinsic record alone determines the proper construction in this case, we are able to conduct our review adequately and we do so *de novo. See Shire Dev., LLC v. Watson Pharm., Inc.*, 787 F.3d 1359, 1364, 1368 (Fed. Cir. 2015) (citing *Teva*, 135 S. Ct. at 840–42).

Infringement is a question of fact. *Absolute Software*, 659 F.3d at 1129–30. "On appeal from a grant of summary judgment of non-infringement, we determine whether, after resolving reasonable factual inferences in favor of the patentee, the district court correctly concluded that no reasonable jury could find infringement." *Id.*

A. Claim Construction

The words of a claim "are generally given their ordinary and customary meaning" as understood by a person of ordinary skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). Because that meaning is "often not immediately apparent, and because patentees frequently use terms idiosyncratically," the court looks to the intrinsic record, including "the words of the claims themselves, the remainder of the specification, [and] the prosecution history," as well as to extrinsic evidence when appropriate, to construe a disputed claim term. *Id.* at 1314, 1319. "[W]hile extrinsic evidence can shed useful light on the relevant art, we have explained that it is less significant than the intrinsic record in determining the legally operative meaning of claim language." *Id.* at 1317 (quotation marks omitted).

Because a patent is a fully integrated written instrument, we have long emphasized the importance of the specification in claim construction. *Id.* at 1315 (explaining that the specification "is the single best guide to the meaning of a disputed term") (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Thus, if the specification reveals a special definition given to a claim term by the inventor, then the inventor's lexicography governs, even if it differs from the term's ordinary meaning. *Id.* at 1316. Likewise, if the specification reveals an intentional disclaimer or disavowal of claim scope by the inventor, then the inventor's intention as expressed in the specification is regarded as dispositive. *Id.* We have found disavowal or disclaimer based on clear and unmistakable statement, such as "the present invention includes . . . ," "the present invention is . . . ," and "all embodiments of the present invention are. . . ." *Pacing Techs., LLC v. Garmin Int'l, Inc.*, 778 F.3d 1021, 1024 (Fed. Cir. 2015).

Netzer argues that "fractionating" means separating a mixture into fractions, no matter what processes are used to do so. According to Netzer, both the intrinsic record and the extrinsic evidence suggest that fractionation includes any method of separation, not limited to distillation. Netzer contends that the patentee did not disclaim extraction by merely characterizing it as expensive in the specification. Netzer additionally argues that the claim only sets a lower limit on benzene purity, *viz.*, "at least about 80 wt %," and thus does not exclude extraction, which produces highly pure benzene. Netzer lastly argues that "fractionating" ought to be construed to encompass the disclosed preferred embodiment, so as to allow the pyrolysis gasoline to pass through (a) more than one process unit (in the preferred embodiment, a hydrotreater and then two distillation columns), and (b) process units that do not separate chemicals, such as a hydrotreater.

Shell responds that "fractionating" should be construed here to mean separating compounds based on differences in boiling points, not generic "separating" by any means. Shell argues that the intrinsic record compels that construction, which cannot be altered by conflicting extrinsic evidence. In particular, Shell contends that the patent specification uses "fractionating" or "fractionation" to describe separating compounds based on boiling points. According to Shell, the patentee also disclaimed extraction in the specification by distinguishing it from "fractionation" and by explaining that the claimed invention was driven by a shift in market demand that no longer required high purity benzene produced by extraction, such as by the Sulfolane process.

We agree with Shell that the claim term "fractionating" in this patent means separating compounds based on differences in boiling points, *i.e.*, distillation, which excludes extraction, such as in the Sulfolane process. The specification repeatedly and consistently uses "fractionating" or "fractionation" to describe separating petrochemicals based on boiling point differentials. Moreover, importantly, the patentee made clear and unmistakable statements in the intrinsic record, distinguishing the claimed invention from and disclaiming conventional extraction methods that produce 99.9% pure benzene.

Specifically, the '496 patent describes an "azeotrope" problem. An azeotrope is a mixture of two or more compounds that has a uniform boiling point; its components vaporize together as a mixture and thus cannot be easily separated from each other by distillation. J.A. 273. The specification explains that certain C_6–C_7 non-aromatic hydrocarbons form azeotropes with benzene, making it "impossible" to separate benzene from that mixture by "conventional fractionation." '496 patent col. 2 ll. 17–20. The specification then discusses this issue in further detail and refers to the azeotrope problem as "the conventional fractionation issue." *Id.* col. 3 ll. 18–35. Thus, the patentee used "conventional fractionation" to refer to conventional distillation, *i.e.*, a conventional method that separates compounds based on differences in their boiling points.

Elsewhere, the specification repeatedly and consistently uses the term "fractionation," whether modified by an adjective or not, in connection with temperature or boiling points. *See, e.g., id.* col. 2 ll. 58–59 ("naphtha resulting from crude oil fractionation has a boiling range of 100 to 350° F"); *id.* col. 2 ll. 62–63 ("naphtha undergoes further fractionation to separate a cut point of below 200° F, light naphtha"); *id.* fig. 1 & col. 5 ll. 9–14 (describing a "Fractionation & PSA Refrigeration" unit in Figure 1, where ethylene, a more volatile compound, is recovered by "refrigerated fractionation," and propylene and C_4 mix, less volatile compounds, are each recovered by "warm fractionation"); *id.* col. 5 ll. 24–34 (stating that the hydrotreated pyrolysis gasoline undergoes "fractionation" for benzene recovery in two distillation columns). Although the specification uses the word "distillation" only in some instances, *id.* col. 2 ll. 23, 60; *id.* col. 3, ll. 10–11; *id.* col. 8, ll. 12–13, the repeated and consistent references to "fractionation" in the context of boiling-point-based separation indicate that the patentee uses "fractionation" to refer to distillation specifically, not to generic "separation."

Importantly, the patentee distinguished conventional extraction from fractionation in the specification, indicating that "fractionation" does not include conventional extraction. After identifying the azeotrope problem encountered by "conventional fractionation," *id.* col. 2 ll. 17–20, the specification explains that "[t]he *conventional* method of benzene purification and separation from the above azeotropes is by *aromatic extraction or extractive distillation* processes, such as [the] Sulfolane [process]," *id.* col. 2 ll. 21–25 (emphases added), which produces >99.9% pure benzene, *id.* col. 2 l. 28. Thus, according to the patentee, conventional extraction and conventional fractionation are different methods. Unlike conventional fractionation, conventional extraction—which includes the Sulfolane process—can successfully remove non-aromatic hydrocarbon azeotropes to produce highly pure benzene. The Sulfolane process is therefore conventional extraction, *not* "conventional fractionation." The Sulfolane process was developed by Shell in the 1960s; it is a conventional method of separation. If one were to adopt Netzer's proposed construction that "fractionation" means separation by any method, then "conventional fractionation" would mean separation by any conventional method, which would encompass the Sulfolane process. That interpretation would be contrary to the specification.

Furthermore, as shown by the intrinsic record, the patentee clearly disclaimed conventional extraction, characterizing it as expensive and not required due to a shift in market demand, and distinguishing it from the "present invention." *Id.* col. 2 ll. 25–28, 33–37, 44–48, 51–55. The specification explains that there had been a strong market demand for "benzene of nitration grade, about 99.9 wt %," *id.* col. 1 l. 54, but that such high purity benzene was no longer required in some circumstances; rather, benzene products from the "present invention" containing non-aromatic impurities can be used in its place. *Id.* col. 2 ll. 46–48 ("the assumed non-aromatic impurities in the benzene, resulting from the application of the *present invention*" (emphasis added)); *id.* col. 2 ll. 54–55 ("This market shift is the major driving force behind the *present invention.*" (emphasis added)). Likewise, the patentee twice stated during prosecution that the claimed process is "particularly useful" "to produce a benzene product that *need not* have a purity over 99 wt %, *much less* over 99.9 wt %, *as previously required.*" J.A. 261, 880 (emphases added).

Those clear statements indicate that the inventor contemplated the claimed invention to be different from conventional extraction, which produces highly pure, nitration-grade 99.9% benzene. If "fractionation" were to include conventional extraction, then the claimed process would yield 99.9% pure benzene and there would not be significant "non-aromatic impurities . . . resulting from the application of the present invention." '496 patent col. 2 ll. 46–48; *see also id.* col. 3 l. 58, col. 4 ll. 26–30 ("In accordance with the inventive method," "fractionation" produces "close to 98 wt % benzene.").

To be clear, we only conclude that the patentee disclaimed conventional extraction, such as the Sulfolane process. We recognize that the claim language only sets a lower limit on the purity of the benzene product, and thus does not preclude other *un*conventional distillation methods that are capable of producing highly pure benzene. But in view of the disclaimer of conventional extraction in the publicly available intrinsic record, Netzer cannot now attempt to recapture the disclaimed subject matter.

Netzer also argues that construing "fractionating" as distillation would improperly exclude the preferred embodiment disclosed in Figure 1 of the '496 patent. We disagree. In that disclosed embodiment, the pyrolysis gasoline is passed through a hydrotreater, and the resulting "hydrotreated pyrolysis gasoline" is then passed through two distillation columns to produce a benzene product with 98% to 99% purity. *Id.* fig. 1 & col. 5 ll. 21–26, 48–51. Contrary to Netzer's argument, the hydrotreater embodiment does not compel a different meaning of "fractionating." The disclosed embodiment merely adds a hydrotreating step—a step that does not separate the individual components of the pyrolysis gasoline from each other, but rather hydrogenates the olefins in that mixture—before the fractionating step; it does not require the construction of "fractionating" to include hydrotreating, or any process other than distillation. Notably, dependent claim 19 is directed to a process "further comprising" a hydrotreating step, *id.* col. 8 ll. 33–35, thus showing that hydrotreating is not part of the fractionating step.

Rather, the intrinsic record suggests that the patentee referred to the hydrotreated pyrolysis gasoline as a type of pyrolysis gasoline: the language of claim 1 defines "pyrolysis gasoline" as "comprising olefins, diolefins and benzene," *id.* col. 7 ll. 28–29, and the specification refers to the product from the hydrotreater as the "hydrotreated pyrolysis gasoline," *id.* col. 5 l. 25, which is then *distilled* twice to form benzene with 98% to 99% purity. Accordingly, under the proper construction of "fractionating," the disclosed embodiment is within the scope of the claims.

Netzer primarily relies on two pieces of intrinsic evidence, but neither supports its proposed construction. First, Netzer notes that dependent claim 11 recites "conventional fractionation in a distillation column." *Id.* col. 8 ll. 9–13. Netzer argues that if fractionation means distillation, then there would be no need to state "fractionation in a distillation column." We find that argument unavailing. The quoted phrase merely requires that the fractionation, or distillation, occur in a distillation column as opposed to in another device. Such specific, clarifying language does not change the meaning of fractionation.

Second, Netzer relies on a passage in the specification, which states that: "Fractionation and production of benzene with over 75 wt % purity from reformer reactor effluent by conventional distillation may become difficult. . . ." *Id.* col. 3 ll. 9–11. Netzer again argues that if fractionation means distillation, then it does not make sense to say "fractionation . . . by conventional distillation." We disagree. Netzer has not quoted the full sentence. The omitted portion of the quoted sentence reads: " . . . because of the azeotrope forming characteristics of compounds such as dimethylpentanes, cyclohexane and methyl-cyclopentane." *Id.* col. 3 ll. 11–13. Thus, that full sentence explains that the listed azeotropes make conventional fractionation, *i.e.*, conventional distillation, difficult. To avoid that problem, one may resort to *un*conventional fractionation techniques, such as the claimed process of cracking the C_6–C_7 azeotropes to convert them to shorter chain and more volatile hydrocarbons before fractionation. Thus, the quoted sentence is entirely consistent with, and indeed supports, our construction of "fractionating."

Accordingly, the intrinsic evidence here points in only one direction, and requires that "fractionating" in this patent be construed as separating compounds based on differences in boiling points. The parties cite conflicting extrinsic evidence, which does not compel a different construction. As we have explained, extrinsic evidence may not be used to contradict claim meaning that is unambiguous in light of the intrinsic record. *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1290 (Fed. Cir. 2015).

We therefore conclude that "fractionating" in the present patent means separating compounds based on differences in boiling points, which excludes conventional extraction methods, such as the Sulfolane process.

B. Infringement

Netzer also argues that the district court erred in granting summary judgment of noninfringement. According to Netzer, under its proposed construction, Shell's accused process satisfies the fractionating limitation because Shell separates 99.9% pure benzene from pyrolysis gasoline. Even under Shell's proposed construction, Netzer contends, Shell still literally infringes the '496 patent because it directs its pyrolysis gasoline through a series of process units, some of which are distillation columns, and forms 99.9% pure benzene in the end. It is irrelevant that the mixture also passes through an extractor as part of that process, according to Netzer, because adding an extra step to an otherwise infringing process does not defeat a finding of infringement. Netzer additionally argues that the district court erred in finding Netzer barred from relying on the doctrine of equivalents to prove infringement, and that the accused process satisfies the function-way-result test as to the "fractionating" limitation.

Shell responds that, under the proper construction of "fractionating," *i.e.*, distillation, or separating compounds based on differences in boiling points, Shell does not infringe the '496 patent because it uses its own Sulfolane process, which uses extraction, not distillation, to form >80% pure benzene. More specifically, Shell explains that its pyrolysis gasoline is refined in multiple steps to yield a mixture containing about 57% benzene, far below the 80% required by the claims; and Shell then uses the Sulfolane process to remove non-aromatic impurities in that mixture to produce 99.9% pure benzene. Shell also responds that Netzer is barred from asserting infringement under the doctrine of equivalents because the patentee disclaimed the

Sulfolane process. Even if Netzer is not barred, Shell argues, the Sulfolane process does not purify benzene in substantially the same way as "fractionating."

We agree with Shell that the district court did not err in granting summary judgment of noninfringement. Shell's process does not literally meet the fractionating limitation. Shell relies on conventional extraction—more specifically, its own Sulfolane process—to refine a mixture containing about 57% benzene to a benzene product of greater than 80% purity. As we have explained, "fractionating" means distillation; it does not include conventional extraction. Moreover, the earlier steps of the Shell process only refine pyrolysis gasoline to produce a 57% pure benzene mixture, which does not satisfy the limitation "to form a purified benzene product comprising at least about 80 wt % benzene."

It is true that a method claim with the word "comprising" appearing at the beginning generally allows for additional, unclaimed steps in the accused process, but each claimed step must nevertheless be performed as written. *Dippin' Dots, Inc. v. Mosey*, 476 F.3d 1337, 1343 (Fed. Cir. 2007) ("[The] enumerated steps must . . . all be practiced as recited in the claim for a process to infringe. The presumption raised by the term 'comprising' does not reach into each of the six steps to render every word and phrase therein open-ended. . . ."). Netzer's infringement theory requires rewriting the claimed step to read "fractionating the pyrolysis gasoline [*and*] form[ing] a purified benzene product" rather than "fractionating the pyrolysis gasoline *to* form a purified benzene product," as the claim is written.

We are also unpersuaded by Netzer's argument analogizing the accused process to the preferred embodiment of the '496 patent, as both process the pyrolysis gasoline through multiple steps and generate >80% pure benzene in the end. As we have explained, hydrotreating is not part of the fractionating step. The hydrotreating step in the preferred embodiment merely produces a hydrotreated pyrolysis gasoline; it is not a step that separates the individual components of the pyrolysis gasoline. In the preferred embodiment, the hydrotreated pyrolysis gasoline is distilled twice to form >80% benzene. In contrast, nothing in the Shell process distills pyrolysis gasoline "to form" >80% benzene.

Moreover, as indicated *supra*, the patentee disclaimed conventional extraction, including the Sulfolane process. Netzer cannot now assert that the claimed fractionating step is literally infringed by the Sulfolane process. Likewise, Netzer cannot show infringement under the doctrine of equivalents. The disclaimer of the Sulfolane process for literal infringement applies equally to infringement under the doctrine of equivalents. *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1347 (Fed. Cir. 2001).

We agree with Shell, moreover, that no reasonable jury would find that the accused process performs substantially the same function in substantially the same way to obtain substantially the same result. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 38–40 (1997). Shell's Sulfolane process does not purify benzene to >80% purity in substantially the same *way* as the claimed process because almost all of the purification in the Sulfolane process is done through extraction, *i.e.*, separating compounds based on solubility differences, which is substantially different from the claimed process of separating compounds based on differences in boiling points. Drawing all justifiable inferences in Netzer's favor, we agree with Shell that Netzer cannot establish infringement under the doctrine of equivalents in light of the substantial difference between the claimed process and the accused process.

We therefore conclude that the district court did not err in granting summary judgment of noninfringement, either literally or under the doctrine of equivalents.

CONCLUSION

We have considered the remaining arguments and find them unpersuasive. For the foregoing reasons, we affirm the district court's summary judgment of noninfringement.

AFFIRMED

UNITED STATES DISTRICT COURT	SOUTHERN DISTRICT OF TEXAS

David Netzer Consulting Engineer LLC, §
Plaintiff, §
§
§ Civil Action H-14-166
versus §
Shell Oil Company, *et al.*, §
§
Defendants. §

Opinion on Summary Judgment

(Filed Aug. 26, 2015)

1. *Introduction.*

An engineer patented a method for producing benzene. His company, to whom he assigned the patent, says that an oil company is infringing the patent. The engineer restricted his claim to the production of benzene between 80 and 98 percent purity by weight. Because the oil company's method produces benzene that is 99.9% pure, the engineer's company will take nothing.

2. *Background.*

David Netzer Consulting Engineer, LLC, holds the '496 patent for producing benzene. Claim one purifies benzene to at least 80% by fractionating pyrolysis gas. Pyrolysis gas – a byproduct of oil and gas refining – is rich in benzene, and it is a common precursor for producing purified benzene. Netzer says that fractionating is a term that includes all methods that separate a mixture into its components; these are illustrative: distillation, liquid-liquid extraction, centrifugation, gel filtration, and foam fractionation. In the '496 patent, components are separated based on their differing boiling points.

Shell Chemical employs a six-step method that purifies benzene to 99.9%. The first five steps are similar to Netzer's patent, except that they produce benzene that is only 50 to 70% pure. In the final step, Shell extracts benzene that is 99.9% pure. This last extraction step had been patented by Shell as the Sulfolane method. Extraction separates the components of the mixture based on solubilities. Unlike Netzer, Shell says that fractionating does not encompass extraction and that fractionating specifically means separating a mixture by its components' boiling points.

Netzer sued Shell Chemical LP, Shell Oil Company, and Shell Oil Products Company LLC.

3. *No Literal Infringement.*

Literal infringement of a method claim means that the infringer performed every step of the method.[1] A critical step in Shell's method is extraction because this step increases the benzene yield from 50–70% to 99.9%. Netzer's method does not include extraction

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[1] Joy Technologies, Inc. v. Flakt, Inc., 6 F.3d 770, 775 (Fed. Cir. 1993).

and does not yield benzene of 99.9% purity. To infringe, Shell would have to eliminate the extraction step and still produce benzene purified to at least 80%. There is no literal infringement.

4. *No Equivalence.*

Netzer is barred from claiming infringement under the doctrine of equivalents by specific exclusion, prosecution-history estoppel, and prior art.

Traditionally, high-purity benzene was required to produce ethylbenzene, a precursor to plastics. Recent technology has made it possible to create ethylbenzene from low-purity benzene, which is cheaper. In its patent, Netzer expressly excludes a method that produces benzene of 99.9% purity. The specification says that his purpose is to take advantage of the recent demand for cheaper, lower-purity benzene. He names Shell's patented Sulfolane method as one of the conventional, more expensive methods, that his patent avoids. No claims mention benzene higher than 97%. The summary of the invention suggests an ideal method that produces benzene that is 98% pure.

Netzer's claim is also barred by prosecution-history estoppel.[2] In response to the United States Patent and Trademark Office, Netzer explicitly said that the '496 patent is useful for producing benzene that does not need to exceed a purity of 99 percent by weight.

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[2] Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722, 733–34 (U.S. 2002).

Finally, Netzer's claim is barred by prior art. The '857 patent by Tokuhisa is a method for producing benzene that is higher than 99.5%. To overcome a prior-art rejection during prosecution, Netzer distinguished the '496 patent by saying that he was not concerned with the high-purity levels of the '857 patent. If Netzer's patent had claimed benzene that was 99.9% pure, it would have been invalidated by the '857 patent. Matter that would have invalidated the patent is necessarily excluded from the patent's scope.[3]

5. *Conclusion.*

In this suit, Netzer is trying to expand its patent's coverage of methods and yields, despite having disclaimed the product and been barred from claiming the method. Infringement of a method patent means that the infringer performs every single step of the method and yields the same product. Shell's method performs the methods in Netzer's patent, but adds a distinct step that yields a nearly pure product. Netzer will take nothing.

Signed on August 26, 2015, at Houston, Texas.

/s/ Lynn N. Hughes
Lynn N. Hughes
United States District Judge

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[3] Wilson Sporting Goods Co. v. David Geoffrey & Associates, 904 F.2d 677, 684 (Fed. Cir. 1990).

CASE 18-2129 (CORRECTED)

United States Court of Appeals
for the Federal Circuit

DAVID NETZER CONSULTING ENGINEER, ***PRO SE***
Plaintiff-Appellant,

v.

SHELL OIL COMPANY, SHELL CHEMICAL LP,
AND SHELL OIL PRODUCTS COMPANY LLC,
Defendants-Appellees.

Appeal from the United States District Court for the Southern District of Texas in Case No. 3:18-cv-75, Judge Lynn N. Hughes

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INFORMAL OPENING BRIEF FOR PLAINTIFF-APPELLANT

[2] Table of Contents

[3] 1. Table of authorities

1. *US patent 6,677,496 January 13 2014 (By David Netzer Consulting Engineer)*
2. *Health Services Acq. Corp. v. Liljeberg, 796 F.2d 796, 802–03 (5th Cir. 1986), aff'd, 486 U.S. 847 (1988)* (Recusal/vacating)
3. *Dixie Carriers, Inc. v. Channel Fueling Serv., Inc., 669 F. Supp. 150, 152 (E.D. Tex. 1987)* (Recusal / vacating)
4. *480 U. S. 915 (1987). We now affirm (rule 455(a)* (vacating).
5. *Transit Gas Co V Security Trust Co 441 F 2nd 788 (1971)* (Tolling time issues)

6. *Kumho Tire Co. V. Carmichael, 526 US 137 (1999)* (expert witness qualification)
7. *See Oakley, Inc. v. International Tropic-Cal, Inc., 923 F.2d 167, 168, 17 U.S.P.Q.2D (BNA) 1401, 1403 (Fed. Cir. 1991).* (**Due Process issues**)
8. **Due Process** Clause of the Fourteenth Amendment.
9. *MGA, Inc. v. GMC*, 827 F.2d 729, 733 (Fed. Cir. 1987). (**Abuse of discretion**)
10. *Electro Med V. Cooper Life (Fed Circ 1994)* (Import limitation on claim)
11. *Hill –Rom Servs, Inv V Stryker Corp (Fd .Cir 2014)* (Import limitation)
12. *DAVID* NETZER LLC v. SHELL *OIL COMPANY. CAFC case 2015-2086*
13. *Randall Little vs. Shell Exploration Comp US DC4:07-CV-871 Feb23 2015*

[4] 2. Jurisdictional statement /related case

The District Court has subject matter jurisdiction over the case under 28 U.S.C 1331 and 1338(a). The district court final judgment was entered on June 26 2018 (Doc. 38). **No related cases** to US 6,677,496 are pending in any US court. The final judgment (dismissal by district court June 26 2018) disposes all claims between Shell Oil Company, Shell Chemical LP and Shell Oil Product Company LLC (collectively "Shell") and Netzer.

On July 2 2018, Netzer filed a timely Notice of Appeal to the Court of Appeals for the Federal Circuit. See FED R App P. 4(a)(1)(A). The Court has jurisdiction over this appeal pursuant to USC 195(a)(1) case **18-2129**

3. **Issues in the briefing / statement of facts** patent 6,677,496

Plaintiff, David Netzer Consulting Engineer hereby appeals to CAFC on two **independent** issues related to infringement of 496 patent (A-1) as originated by rulings of Southern District Court of Texas and both originated and consolidated from the **same case** 3:18-cv-75. Issue no-3 as shown below (A-3) is totally independent and is related to second issue (b) as shown below.

a. Filing a Motion (Doc. 25) (A-10) by Netzer for **recusal** of Judge Hughes of Houston Division as (A-11) was denied on June 20 2018 (Doc. 36) (A-11)

[5] b. Final dismissal (Doc.38) by Judge Hughes on June 26 2018 (Doc. 1) of petition by Netzer, for a **new trial** and **vacating** Hughes. (A-12)

c. Independent of issues to (a) (b), Netzer is bringing up errors of CAFC in case 2015-2086, May 27 2016 and requesting correction by CAFC

The petition as related to issues (a) (b) above was filed in Southern District of Texas, **Galveston** Division and was based on a

second set of new evidence, totally **independent** of the first set of new evidence (Doc. 1 appendix A) (A-5) that was filed originally on April 27 2017. In this petition, Netzer plead the District Court, **Galveston** Division that in addition to accepting the **second set of new evidence,** and vacate Judge Hughes, also to accept the **first set** of new evidence, as a basis for a new trial. This **first set** of new evidence was filed under rule 60 (b) (6) as a motion for reconsideration related to case 4:14-CV-00166. This motion was dismissed by Judge Hughes on May 16 2017. (Doc. 1 appendix B) (A -6)

4. **Status of current litigation,** (A-7 shows old history of the case)

    a. On March 12 2018 David Netzer transferred the ownership of the 6,677,496 patent from David Netzer Consulting Engineer **LLC** to David Netzer Consulting Engineer, to allow proceeding as *Pro Se.*

    [6] b. On March 13 2018 David Netzer filed a lawsuit against the above defendants based on new set of evidences requesting **recusal** and vacating Judge Hughes based on inappropriate social contacts with Shell as well as claimed **bias** in favor of Shell. The petition was filed under rule 60 (b) (6) **or any other appropriate civic rule** (Doc. 1) (A-7).

    c. Shell, (Doc. 12) filed a Motion for Pre-Motion hearing. In this Motion Shell admitted a connection with Judge Hughes as a result of their

> being on the board of World Affairs Council as discussed below.

> In the Pre-Motion hearing (Doc. 22) (A-8), May 30 2018, Netzer explained to Judge George Hanks Jr. that the principal reason for filing the case in Galveston Division and not to Houston was to **avoid** Judge Hughes who's neutrality in the case is being **questioned.** Then Judge Hanks ordered Netzer to re-file under different civic law by June 14, 2018 (A-8). The next day, May 31 2018, Netzer learned that the case was transferred to Judge Hughes (Doc. 21). (A-9)

As described above, the **uncalled interference** of Judge Hughes raises questions about Judge Hughes' impartiality that could amount to a **violation of plaintiff's rights to Due Process.**

After the case was transferred to Judge Hughes on May 31 2018, then on June 4 2018, Netzer filed a Motion, seeking **recusal** of Judge Hughes (Doc 25) (A-10)

[7] On June 5 2018 Shell sent a letter directly to Judge Hughes case manager, not to the docket of the court (Doc 28) as would be the normal procedure. In this letter Shell requested a hearing with Judge Hughes regarding recusal issues. Hearing was set for June 20 2018. On the very same day just as the hearing had started, the Motion for recusal was verbally denied. This unusual sequence leads one to question: What was the purpose of the hearing, and, why Shell was **insisting** of having Judge Hughes preside over the case. On June 26 2018 the case was dismissed for reasoning of **res judicata,** referring to prior affirmation of CAFC,

and again referring to "Netzer's Technicians" who had offered new evidence (Doc. 38) (A-12) (A-14)

5. **Appeal for denial Motion of Recusal June 20 2018**
    a. The **Due Process** (table of authorities No-8) was violated by Judge Hughes
    b. Judge Hughes has demonstrated **bias** and **abuse** of judicial discretion.
    c. New information as related to social/business activity of Judge Hughes with Shell as discussed below in violation of rule 455 (a), perception of conflicts
    d. Judicial finding by Fifth Circuit Court of Appeal has resulted in **vacating** of Judge Hughes and **reassigning** in a case of Shell Vs. legal adversaries.

6. The Petitioner's Due Process Rights Were Violated

In certiorari petition to US Supreme Court, the below arguments were made:

[8] "Federal Circuit precedence shows that *novo de* review cannot be performed when the district court's findings of fact and conclusions of law are insufficient to allow for a meaningful appellate review. After noting that such a conclusory finding was entirely inadequate under Fed. R. Civ. P. 52(a), the federal circuit concluded: ***"The entire omission of a claim construction analysis from the opinion, and the***

***conclusory factual findings on infringement, each provide an independent basis for remand. Because insufficient findings preclude meaningful review by this court, we remand.*"** *See Oakley, Inc. v. International Tropic-Cal, Inc.*, 923 F.2d 167, 168, 17 U.S.P.Q.2D (BNA) 1401, 1403 (Fed. Cir. 1991).

A review of the management order in Appendix D shows that the district court ordered Shell to produce extrinsic evidence to the petitioner. However, the petitioner was not provided the opportunity to depose and test the credibility of the evidence. Additionally, Shell utilized extrinsic evidence of an expert that was not cross examined by the petitioner. Yet, the court proceeded to enter final judgment based upon biased one sided extrinsic evidence presented by Shell. Furthermore, as recognized by the federal circuit, the district court presented arbitrary factual reasoning on the record regarding fractionation. Thus, based upon the face of the record, the petitioner was denied a fair opportunity to present its case. Petitioner [9] right to fair trial and arbitrary state action are interests that are protected by the **Due Process** Clause of the Fourteenth Amendment.

The district court's arbitrary analysis of the law of infringement, the applicability of the doctrine of equivalents, and of prosecution history estoppel and asserts that the decision reveals "a violation of substantive due process because of its arbitrary and capricious nature." *MGA, Inc. v. GMC, 827 F.2d 729, 733 (Fed. Cir. 1987).* Thus, as in *MGA*, because the district court and federal circuit entry of judgment against the petition occurred in such an arbitrary or improper manner, the petitioner's due **process** rights has been violated. *Id.*"

7. Mistakes (cardinal error) in summary judgment

In the Summary Judgment August 26 2015 (Doc 1 app C) (A-2), Judge Hughes held the following in the introduction section.

"*The engineer (that is Netzer) restricted his claim to the production of benzene between 80-98 percent purity by weight. Because the oil company (that is Shell) produces benzene which is 99.9% pure, the engineer's company will take nothing*". Shell did not advocate this position on benzene purity at the District Court (case 4:14-cv-00166) or even on appeal to CAFC (case 2015-2086), presumably because the holding is clearly incorrect and ignored the open ended claim language ("at least 80 weight% benzene). This cardinal error although corrected by CAFC has [10] inhibited Netzer from licensing US patent 6,677,496 for 9 months. The correction by CAFC of Summary judgment as shown below, amounts to very significant **substantive change** because all existing benzene processors in US are producing 99.9 percent purity benzene and **regardless** of method of benzene purification. Because Judge Hughes on his own accord *(sua sponte)* divined a new reason for Shell to prevail, that is contrary to horn-book patent law, then an objective observer might reasonably question the judge's impartiality.

The following is a statement from the opinion of CAFC case 2015-2086, of May 27 2016, correcting this error

"We recognize that claim language only set a ***lower limit*** *on the purity of benzene product and does* ***not preclude*** *other non- conventional distillation method that are capable of producing highly pure benzene"*

8. Statement of bias and abuse of discretion

Refer to Doc 1 appendix B (A-6) and again to Doc 38 (A-12). Judge Hughes has referred to James Storm former Sr. Technical Expert with Shell as "Netzer's Technician" **based on no litigation contact**, and all this after updated declaration of James Storm was introduced (Doc.34) along with supporting opinions of three top technical experts (Doc 25 &34) (A-14)

[11] a. In February 2017 Mr. James Storm who retired in2016 as a Vice President of Saudi Refining Inc. (SRI) came forward with new evidence (Doc. 1 Appendix D and Doc. 34). Saudi Refining Company (SRI) is 50% joint venture of Motiva Enterprises along with **Shell** that owns the remaining 50% of the joint venture. Prior to Storm's affiliation with SRI he was a senior **Technical Expert with Shell.** Prior to Storm's retirement in 2016 he was unavailable. In this declaration (Doc. 1 Appendix D) (A-4), Mr. James Storm presented new evidence that Shell has **infringed** the 6,677,496 patent and **misled** the District Court of Southern District of Texas.

b. James Storm holds MS degree in Chemical Engineering and with 40 years of experience in petroleum refining and chemical processing. His new evidence was reviewed by no less than three (3) top technical experts, skilled in the art and with relevant experience. (Doc. 1 appendices E &F Doc. 34) (A-14) All of them have fully endorsed the declaration of James Storm as being very **significant** and **credible.**

c. In addition to the above, Netzer has discovered a public announcement of Shell Qatar of year 2011 that **was archived.** This announcement (Doc 1 appendix A) (A-5) gave an **intrinsic** interpretation to disputed terms of art, **fractionation vs. extraction,** between Netzer and Shell.

[12] d. The above new evidence of items (a) (b) and (c) were totally dismissed by Judge Hughes (Doc. 1 appendix B) (A-6). Judge Hughes maintained that these evidences (of item A, B &C) were filed out of time, amounted to "another opinion on existing data" and dismissed James Storm as **"Netzer Technician"**

e. Delphine James- Law filed an appeal to Fifth Circuit Court of Appeal, **not to** CAFC because the appeal involved admission of new evidence (not patent law).

f. The Fifth Circuit denied the appeal on ground of lack of Jurisdiction (not on the merit) but declined the petition to transfer the case to CAFC.

g. On Dec 29 2017 Delphine James- Law filed a certiorari petition to US Supreme Court to force Fifth

Circuit to transfer the case to CAFC. It was denied.

9. **Amended civic rule 455. (a) statute for recusal**

JUSTICE STEVENS delivered the opinion of the Court.

"In 1974 Congress **amended** the Judicial Code "**to broaden** and clarify the grounds for judicial disqualification." 88 Stat. 1609. The first sentence of the amendment provides:

"Any justice, judge, or magistrate of the United States shall disqualify himself in any proceeding in which his impartiality might reasonably be questioned." 28 U. S. C. § 455(a), as amended".

[13] In the present case, the Court of Appeals for the Fifth Circuit concluded that a violation of § 455(a) is established when a reasonable person, knowing the relevant facts, would expect that a justice, judge, or magistrate knew of circumstances creating an appearance of partiality, notwithstanding a finding that the judge was not actually **conscious** of those circumstances. Moreover, although the judgment in question had become final, the Court of Appeals determined that under the facts of this case, the appropriate remedy was to **vacate** the court's judgment. We granted certiorari to consider its construction of § 455(a) as well as its remedial decision. 480 U. S. 915 (1987). We now affirm." The case laws No-2 &3 from table of authorities are supporting **vacating** of Judge Hughes.

Newly discovered facts to support recusal /vacating

Federal Judge Lynn N Hughes and **Norton Rose–Fulbright** law, which is the law firm that represented Shell in litigation against Netzer on case 4:14-cv-00166, were **all board members** and occasional sponsors of World Affairs Council of Houston, and were board members in 2014 (Doc. 1 appendices G, H, I and Doc 25). Shell and Judge Lynn Hughes were sponsors, board members and donors in 2014 when litigation started. None of the public disclosures by Judge Hughes have pointed toward his affiliations with World Affairs Council of Houston. Further, none of the disclosures by Shell have pointed to Shell's sponsorship and [14] membership on the board of World Affairs Council of Houston. All this was discovered recently, totally by a chance. The World Affairs Council of Houston (Doc. 1 appendix I) enrolls some 7,000 members. Only some 45 of the members are board's members and there are some 20 sponsors (Doc.1 Appendix H & Doc.25), (A 10) (Doc. 1 appendix H & Doc. 25) shows that all the 20 sponsors members are mostly large companies, for example **Shell.** Most of the board members are lawyers representing law firms such as **Norton-Rose.** Judge Hughes (Doc . 25) (A-10) is the only Judge on the board. Judge Hughes according to financial report of World Affairs Council is also a significant donor (Doc. 25) to World Affairs Council, thus one could argue of financial interest in World Affairs Council. Further, Judge **Hughes**, **Norton Rose** Fulbright and **Shell** (Doc. 1 appendix H) (A-10) are occasionally sponsoring events of World Affairs Council. In short, a board's members like Judge Hughes and Norton Rose Law firm are networking with legal adversarial of Netzer, such as Shell and present major potential opportunities for **conflict** of interest to arise. Further, it is reasonable to assume that sponsors through very high annual membership fee, per year (Doc 1. appendix I & Doc. 25), are financially supporting the council and more specifically supporting the board members including Judge Hughes . The following paragraph is extracted from website of World Affair Council (Doc. 1 appendix I) to illustrate the intimate relationship among the above parties at [15] elevated position, means not by a chance crossing paths with each other "while standing in the cashier's line in the supermarket".

"The Council Cabinet is composed of individuals, corporations, and foundations that share a commitment to furthering education in international affairs. They stand ready to lead and support the goals of the Council. Members of the Council Cabinet meet regularly with distinguished leaders from the United States and abroad. They enjoy private dinners as well as have access to exclusive receptions and ***off-the-record*** *briefings"*

> Netzer fully recognizes that the Judge is entitled to his personal and professional life including being a board member of World Affairs Council. Saying that, given the circumstances of Netzer vs. Shell and having **Norton-Rose-Fulbright** Law in the middle of it, brings further questions about

conflict of interests or the **perception** of conflict of interests as well defined in the **updated** statute **28-U.S.C 455(a)**

Given the above, Judge Hughes should have advised the parties Netzer and Shell of his affiliation with World Affairs in an **elevated** position and given Netzer an opportunity to file a motion for recusing. However, Judge Hughes did not inform Netzer about his affiliation with World Affairs. In response to the above in petition for pre-Motion hearing (Doc 12) Shell admitted being a [16] member on the board of World Affairs. During June 20 2018 hearing with Judge Hughes, the Judge admitted his affiliation with World Affairs Council and made the statement "I am not corrupt". Netzer did not claim that the Judge is corrupt but simply brought it before District Court and brings it again before CAFC. The claim of the Judge (Doc. 38) (A-12) that Netzer "attacked" the Judge is misleading and one can't dismiss the suspicion of hostility and further bias by Judge Hughes.

10. Judicial finding recusal/ vacating

Lynn Hughes has been removed by the Fifth Circuit from the case of Shell. Randall L Little vs. Shell Exploration Comp US DC 4:07-CV-871 Feb 23 2015, see below public news item: "For more than nine years, U.S. District Judge Lynn Hughes of Houston presided over a False Claims Act case in which two auditors from the U.S. Minerals Management Service accused Shell Exploration of improperly deducting transportation and storage costs from the royalties it owes the U.S.

government on offshore oil and gas leases. Hughes didn't think much of the plaintiffs' claims. He granted summary judgment to Shell in 2012, and then, after the 5th U.S. Circuit Court of Appeals **revived and remanded** the suit in 2012, **granted** Shell's renewed summary judgment motion in 2014".“Hughes is now off the case. On Monday, a three-judge 5th [17] Circuit panel **ruled** that in his 2014 summary judgment opinion, Hughes ignored its remand instructions and reached flawed conclusions. **Reassignment** would be advisable to preserve the appearance of justice, given the long delays, repeated errors and cursory reasoning in the district court's opinions to date," wrote 5th Circuit Judge W. Eugene Davis for a panel that also included Judges Jacques Wiener **and Catharina Haynes. The panel also vacated Hughes**"

Comments by Netzer The decision by Fifth Circuit was issued Feb 23, 2015, after all briefings and counter briefings were presented to Judge Hughes and prior to Summary judgment. Netzer was not aware of these judicial findings prior to the summary judgment of August 26 2015.Based on the above, a neutral observer can reasonably conclude that this judicial finding demonstrates that Judge Hughes favors Shell over their legal opponents. Further, the reference of Fifth Circuit to “*repeated errors and cursory reasoning*” just keeps repeating itself in the case of Netzer vs. Shell. **Reassignment** to another Judge is exactly what David Netzer asked Judge Hughes during the June 20 2018 hearing and suggested to have Shell bring their arguments before a new Judge.

11. Issues of Dismissal-acceptance of new evidence

[18] Judge Hughes adopted the following arguments brought initially on May 15 2017 in response to a Motion for reconsideration (Doc 1 appendix B) (A-6) – and again during the oral hearing (Doc 35) June 20 2018.

- **a.** The petition of Netzer of April 27 2017 was brought out of time; meaning more than a year from Entry of Final Judgment that occurred on March 31 2016.
- **b.** The "new evidence" particularly the declaration of James Storm are not new evidence and as the Judge said (Doc **38), (A-12)** "re-hash" of old evidence, thus barred by the doctrine of res judicata

12. <u>Tolling of time, Rule 60 (b) (60 (c) **(See A-13)**</u>

Comments by Netzer

Based on rule 60 (b), the **legal proceeding (see A-13)** ended on May 27, 2016 when CAFC affirmed the summary judgment as issued by Judge Hughes on August 26, 2015. By this time line the Motion was filed **within 11 months.**

Shell argued in their May 15 2017 response (Doc. 12 &Doc. 35) that Entry of Final Judgment which occurred on March 31 2016 is controlling, the one year tolling, thus since March 31 2017 Netzer was barred from filing petition for relief or reconsideration. Shell has presented a few case laws that appellate court has

[19] ruled that "Entry of Final Judgment" is the benchmark for tolling of time (Doc.12). However, and this is **extremely important**, in none of these case laws the appellate courts have ruled that tolling by "Entry of Final Judgment" prevails over "End of legal proceedings". Further in one case law (table of authorities no - 3) appellate court has ruled that once an appeal on judgment results in **substantive change** which is the case of Netzer vs. Shell, then the timing of issuance of the correction by Appellate Court, May 27 2016 in this instant case, should serve as a benchmark. Further, the April 27 2017 Motion for reconsideration was relied on rule 60(b)(6), that per the **discretion** of the court, there would be no time limit for Motion for reconsideration. . Given the above Netzer views the dismissal of the petition for reconsideration based on "filing out of time" to be legally wrong and on top of it an **abuse of discretion** by Judge Hughes. Given the above timing for filing for reconsideration as of April 27, 2017 met the tolling criteria of rule 60b(6) but also adhered to the following

1. 60b(1) Mistakes by District Court as acknowledged by CAFC
2. 60b(2) Newly discovered evidence as presented below
3. 60b(3) Fraud/misrepresentation as presented below
4. 60 b(5) The Judgment was partially reversed in correcting the mistakes.

13. Public disclosure of Shell in Qatar

[20] See Doc.1 appendix A. (A-7) This is not Netzer saying it, it Shell's by own words claimed that distillation is **synonymous** with extraction thus making prior litigations including affirmation by CAFC about intrinsic interpretation of the claim, almost a moot point. The news release of Shell in Qatar simply amounts to an **admission of guilt.** Shell's argument was: This public announcement has been on the website since year 2011. Then why Netzer did not bring it up before? The same question was reiterated by Judge Hughes during the June 20 hearing (Doc. 35). **Here is the answer:** This disclosure by Shell in Qatar was archived. When Netzer conducted the search, it was conducted on technically relevant issues as related to the subject matter. The.

This disclosure by itself, on a technical level is not even remotely related to the subject matter in litigation but provides a strong intrinsic **legal interpretation** of the disputed **intrinsic** evidences and as said all this is by Shell's own words. Further, no one can dismiss the suspicion that this website was archived by Shell in order to **conceal evidence** of infringement.

14. Rule 702/705.Testimony by Expert Witnesses

See Appendix A-13

Comments by Netzer

[21] Per rules 702 **(see appendix A-13)** the claim that James Storm declaration is "an opinion on existing

data" is clearly **incorrect.** The following facts, **not opinions**, were brought by James Storm and totally contradict the ruling of Judge Hughes that James Storm merely expressed an **opinion** on existing data. These facts Netzer call it **new evidences** shade different light on intrinsic evidences. Further, James Storm's opinion was formed by knowledge of facts that could not be disclosed due to secrecy obligation to Shell. Nevertheless the opinion resulting from these facts could be admissible evidences per rule 705. This is supported by a case law from Supreme Court item No-4 in table of authorities. *Kumho Tire Co. v. Carmichael*

The technical education, technical experience and intimate exposure of James Storm to policies and operations of Shell would certainly qualify him by the very strict standard as a **fact witness**. And, let alone the fact that his findings are endorsed by three top experts (Doc 25 &34). Further, it is worth noting that Mr. James Storm and in 2016 appeared as an expert witness and on technical matters in a legal proceeding between a joint venture of Shell and an engineering contractor. Mr. James Storm is interpreting the **intrinsic** evidences from very unique position and this position and knowledge of James Storm **was not available to CAFC** during the *de novo* review of case 2015-2086 (Netzer Vs. Shell)

[22] 15. New evidences by James Storm technical expert of Shell.

The legal declarations of James Storm (Doc. 1 appendix D & Doc. 34) (A-4) as said, it are also supported by expert's opinions shown in (Doc. 1 appendices E &F and Doc 25 &34) Here are couple of new **tangible** evidences aside of the expert interpretation of intrinsic evidences. As discussed the argument by Judge Hughes that declaration of James Storm is a "re-hash"(Doc. 38 Doc.1 appendix B) (A- 12) has absolutely **no merit.** ***Further. In Doc.44, of July 10 2018 Shell has shifted the position of "no new evidence" and now claiming that the "new evidences" are extrinsic evidences. Therefore by own words defeating the argument by Judge Hughes for dismissal due to Res Judicata***

a. Mr. Storm brings up the **extremely important** fact (Doc. 1 appendix D) (A-4) and supported by two experts opinions that the steam cracker in the preferred embodiment as being used to overcome the "azeotrope problem" and using benzene rich feed to the steam cracker is something that was opposed by the conventional wisdom at the time of the invention. This represents the **core** of the invention and clearly demonstrates that CAFC simply **misunderstood** the patent. Further, based on this premise of misunderstanding the patent, CAFC in case 2015-2086 imported limitation to the claims from the specification, thus **contradicting** prior ruling of CAFC (table of authorities no- 10 &11) (A-3).

[23] **b.** James Storm (Doc. 1 appendix D) (A-4) brings up the **new evidence,** that the "**expensive**" benzene extraction unit has been around in the disputed facility in Deer Park Texas for some over 30 years, with a totally sunk capital, thus defeats the attempt of Shell to equate the term "expensive" as a manifest of exclusion. The word "**expensive**" as was referred in the 496 patent was a key word for claiming by CAFC (2015-2086) as disclaiming extraction .(A- 3)

16. Expert evaluations Storm's evidence

The expert opinions of Mr. John Hardy and Mr. Chris Wallsgrove is introduced in the March 13 2018 pleading to district court (Doc. 1 appendices E &F, Doc. 25). (A -14) They both are former employees of ABB Lummus a major licensor of steam cracking technology that normally is including benzene recovery. ABB Lummus has **licensed to Shell** Chemicals LLP technologies for steam cracking which are similar to the technology in the disputed matter. These expert opinions further support the credibility of the testimony of James Storm.

23. *De novo* review (case 2015-2086) by CAFC (A-3)

One could claim that further challenge to prior affirmation by CAFC is barred by doctrine of *Res Judicata*. Therefore in this appeal to CAFC, Netzer is relying totally on new evidences as shown above, surmising that had these evidences been [24] in front of CAFC during the *de novo* review, the summary judgment of District Court in case 4:14-cv-00166 Netzer Vs. Shell would have been reversed.

Nevertheless, the position of Netzer is even based on **old evidences** the CAFC made some errors during the *de novo* review as shown below. Although these errors are not part of current legal challenge to District Court, Netzer is pleading CAFC to review the below errors and per the discretion of CAFC to retroactively correct and hopefully **reverse** prior affirmation of case 2015-2086. **(A-3)**

The pleading for correcting and reversing prior affirmation by CAFC May 27 2016, of case Netzer Vs. Shell (2015-2086) is appropriate, and the reason: Judge Hughes on his dismissal order of present case 3:18-cv-75 (Doc. 38) (A-12) **has relied upon prior affirmation** of CAFC. As shown below, the prior affirmation by CAFC is rooted in no less than six (6) errors of interpreting the intrinsic evidences of the patent and let alone importation of **limits** on the claim by incorporating these 6 errors as shown below to the limitations /exclusions of the 496 patent. The following statements are cited from the opinion of CAFC. (A-3)

a..“ *We (means CAFC) determine whether, after resolving in favor of the patentee the district court correctly concluded that* ***no reasonable jury*** *could find infringement.*” Based on the above the question is: The opinion of District Court of Summary Judgment (Doc. 1 appendix C)**(A-2)** made no reference to “reasonable [25] Jury”. Further if such a reference would have been made, then the question could be : What is the **factual** basis of this conclusion about "reasonable Jury"

b. "the present invention is. . . ." And "**all** embodiment of the present invention are. . . . *Pacing Techs, LLC v Garmin Int'*." This reference is misleading. It reads that CAFC implies that Netzer has restricted his invention to the preferred embodiment of the patent that avoids extraction. **This is simply not correct**. Please refer to the patent 6,677,496 column 4 line 38-40 DESCRIPTION OF THE DRAWING: "*FIG 1 is a flowchart illustrating* ***ONE*** *embodiment of the method of the invention where ethylbenzene and cumene are coproduced with olefins*". For the record, Shell is producing olefins and cumene, thereby practicing and infringing independent claim No-1, dependent claim No-9 and several other dependent claims. Netzer's patent did not **restrict** the embodiment of the patent to the **ONE** embodiment as shown in the flow chart.

c. The CAFC stipulated that in the-496 patent; column 2 lines 57-58 and line 63 was evidence that Netzer had limited the term fractionation to separation by boiling points. This claim and conclusion by CAFC is completely **incorrect.** Line 57 reads: *Typically straight run full range naphtha resulting from crude oil fractionation has a* ***boiling range of 100 to 350 degrees F****. Line 63 reads further fractionation to separate cut point of below 200 degrees F.* First of all, the patent [26] language use of the word TYPICALLY which is **not** an expression of exclusivity. However, the key point is as follows: The word "fractionation" refers to a method of producing the product and the term "**boiling range**" refers to the product's specifications. These two terms, the method and specifications are **mutually exclusive**. Thus any attempt to use this logic and impose it as a limitation on the claim is not correct and is in total conflict with pre -existing case laws by CAFC as cited in table of authorities item no-10 & 11.

d. *"the- 496 patent describes an "azeotrope" problem. The specification explains that certain C6-C7 non aromatic hydrocarbons form an azeotrope with benzene making it "impossible" to separate benzene from that mixture by "conventional fractionation"* This reference, demonstrates that CAFC simply **did not understand** the patent. As be discussed under new evidences. The ingenuity of the patent is that the "azeotrope problem" by Netzer's method is solved by using the steam cracker, step 3 of the first claim and not by extraction or extractive distillation as commonly practiced. The concept of feeding hydrocarbon, rich in benzene, 28.5 weight percent as shown in the material balance, was **totally opposed** to the conventional wisdom during the time of the invention.

e. "The patentee clearly disclaimed conventional extraction characterizing it as ***expensive*** *and not required due to shift in market demand. And distinguishing it* [27] *from the "present invention"* Again, this is another **incorrect** statement. First of all, the word "expensive" is not a manifest of exclusion or disclaiming. Further, as shown later in new evidence, Mr. James Storm is informing through his new evidence (Doc. 1 Appendix D) (A- 7) that the particular Sulfolane benzene extraction unit in dispute has been operated by Shell for **over 30 years**, well prior to the infringement which commenced in the year 2009. Use of extraction by Shell was **not expensive** to Shell and this fact as emerged, defeats the interpretation of the word "expensive" as manifest of exclusion or intention of exclusion.

f. The patentee twice stated during prosecution that the claimed process is *"particularly useful"* to produce benzene product that *need not* have purity over 99 wt%, *much less* over 99.9wt% as previously required. This interpretation is a **grammatically incorrect.** The term *"need not"* or *"much less"* are expression of being superfluous and not expressions of exclusion or disclaiming. Put in layman language: if benzene producer wants to produce 99.9% purity benzene, then in most cases, but **not in all** cases it may not be necessary. However, if benzene producer wants to do it and pay the extra cost, then the producer is free to do so, **but still infringing the patent**. As said Shell already operates the benzene extraction for producing 99.9 wt% benzene purity, so there is no additional cost.

[28] **24. Pleading for relief and new trial**

David Netzer, Consulting Engineer is pleading the Court of Appeal Federal Circuit to reverse prior ruling of District Court on both accounts as below.

1. Recuse and vacate Judge Lynn Hughes and reassign the case to **another** Judge

2. Reverse the final dismissal (Doc. 38) (A-12), **reassign** the case to another judge in **any appropriate** district and order a jury trial.

3. Review the cited errors shown in section 23 by CAFC (case 2015-2086) correct the errors (A-3) and per discretion reverse prior affirmation of Summary Judgment.

25. Certificate of Service case 18-2129 (Netzer Vs Shell

A single copy of this document was sent by mail via FEDEX on July 21 2018 to; Attorney of defendants Ms. **Jayme Partridge,** C/O Fish &Richardson PC, 1221 McKinney St STe 2800 Houston, Texas 77010.

Sent By : *David Netzer, 2900 S Gessner Rd Apt 1407 Houston Tx 77063* *netzerd@sbcglobal.net* *Tel 832 251 1271*

/s/ David Netzer July 21, 2018

No. ________

In The
Supreme Court of the United States

◆

DAVID NETZER, CONSULTING ENGINEER,

Petitioner,

v.

SHELL OIL COMPANY, SHELL CHEMICAL LP
AND SHELL OIL PRODUCTS COMPANY LLC,

Respondents.

◆

**On Petition For A Writ Certiorari
To The United States Court Of Appeals
For The Federal Circuit**

◆

PATENT APPENDIX VOLUME

◆

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TABLE OF CONTENTS

Page

US006677496B2

(12) **United States Patent**
Netzer

(10) **Patent No.: US 6,677,496 B2**
(45) **Date of Patent: Jan. 13, 2004**

(54) PROCESS FOR THE COPRODUCTION OF BENZENE FROM REFINERY SOURCES AND ETHYLENE BY STEAM CRACKING

(76) Inventor: **David Netzer**, 7979 Westheimer Rd., Apt. 1408, Houston, TX (US) 77063

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 116 days.

(21) Appl. No.: **10/000,559**

(22) Filed: **Oct. 23, 2001**

(65) **Prior Publication Data**

US 2003/0092952 A1 May 15, 2003

Related U.S. Application Data

(60) Provisional application No. 60/315,814, filed on Aug. 29, 2001.

(51) **Int. Cl.**^{7} **C07C 4/04**

(52) **U.S. Cl.** **585/648**; 585/650; 585/483; 585/323; 208/67; 208/69; 208/130

(58) **Field of Search** 585/323, 485, 585/648, 650; 208/67, 69, 130

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,294,857	A	*	12/1966	Tokuhisa et al.	585/841
3,470,085	A	*	9/1969	Parker	208/143
4,167,533	A	*	9/1979	Raymond	585/251
4,215,231	A	*	7/1980	Raymond	585/251
4,458,098	A	*	7/1984	Antos	585/660
4,806,700	A	*	2/1989	Martindale	585/322
5,189,233	A	*	2/1993	Larkin et al.	585/265
5,258,563	A	*	11/1993	Gosling et al.	585/322
5,856,607	A	*	1/1999	Kim	585/448
5,880,320	A	*	3/1999	Netzer	585/448
5,952,532	A	*	9/1999	Durante et al.	568/802

* cited by examiner

Primary Examiner—Walter D. Griffin

(57) ABSTRACT

A process for the coproduction of purified benzene and ethylene is provided. The method comprises providing a first mixture comprising benzene, toluene, and one or more C_6 to C_7 non-aromatics and separating the majority of the benzene and the one or more C_6 to C_7 non-aromatics from the majority of the toluene to form a second mixture containing benzene and at least a portion of the one or more C_6 to C_7 non-aromatics. Thereafter at least about 80% of the C_6 to C_7 non-aromatics in the second mixture are cracked while maintaining essentially no cracking of benzene to produce a cracked product containing ethylene, propylene and pyrolysis gasoline comprising olefins, di-olefins and benzene. The pyrolysis gasoline is preferably hydrotreated and then fractionated to form a purified benzene product comprising at least about 80 wt % benzene. The purified benzene can be used as a feed to a liquid phase or mixed phase alkylation and/or to produce ethylbenzene or cumene.

23 Claims, 1 Drawing Sheet

S. App. 2

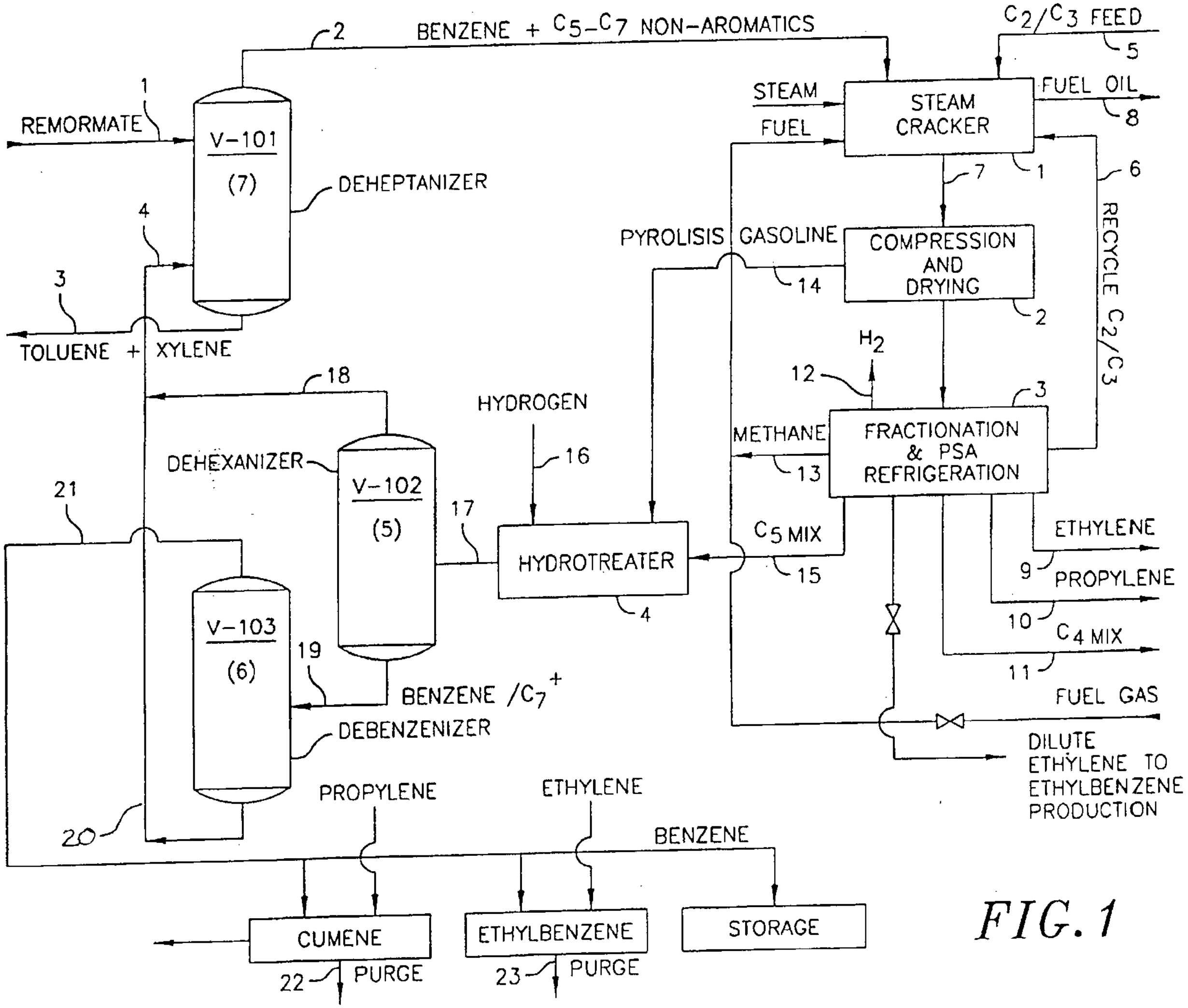
BENZENE + C_5–C_7 NON-AROMATICS
2
C_2/C_3 FEED
5
REMORMATE
1
V–101
(7)
DEHEPTANIZER
STEAM
FUEL
STEAM CRACKER
FUEL OIL
8
1
7
6
4
3
TOLUENE + XYLENE
PYROLISIS GASOLINE
14
COMPRESSION AND DRYING
2
RECYCLE C_2/C_3
H_2
12
3
18
HYDROGEN
16
METHANE
13
FRACTIONATION & PSA REFRIGERATION
DEHEXANIZER
V–102
(5)
17
21
HYDROTREATER
4
C_5 MIX
15
ETHYLENE
9
PROPYLENE
10
C_4 MIX
11
V–103
(6)
19
BENZENE /C_7^+
DEBENZENIZER
FUEL GAS
DILUTE ETHYLENE TO ETHYLBENZENE PRODUCTION
20
PROPYLENE
ETHYLENE
BENZENE
CUMENE
22
PURGE
ETHYLBENZENE
23
PURGE
STORAGE

FIG. 1

PROCESS FOR THE COPRODUCTION OF BENZENE FROM REFINERY SOURCES AND ETHYLENE BY STEAM CRACKING

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of provisional Patent Application No. 60/315,814, filed Aug. 29, 2001.

BACKGROUND

About 50% of benzene consumption in the petrochemical industry is directed to the production of ethylbenzene, an additional about 25% is dedicated to the production of cumene, and another 15% goes toward the production of cyclohexane. About 4 to 5% of benzene is directed to the production of nitrated products. Ethylbenzene is a precursor for the production of styrene, which is a precursor for the production of polystyrene, and cumene is a precursor for the production of phenol.

Benzene is obtained from various sources. Over 55% of all benzene is attained from to petroleum refining, mostly catalytic reforming of naphtha. Additionally, over 30% of all benzene is obtained from pyrolysis gasoline resulting from steam cracking in olefins production and under 15% is obtained from coke oven gas, originated from coal, as related to iron and steel production. All the above sources are coproducers of toluene, and a significant portion of toluene is converted to benzene by either hydrodealkylation or by coproduction of xylenes.

Production of ethylene by gas crackers, mostly C2–C3 and some C4 feeds, amounts to about 40% of the world ethylene capacity. This results in a relatively small coproduction of benzene compared to benzene coproduced in naphtha and gas oil crackers, which account for 60% of the world's ethylene production capacity. A typical overall benzene yield from ethane cracking is on the order of 0.60 wt % of the ethane feed, and benzene yield from propane cracking is on the order of 3.0 wt % of the propane feed. Benzene yield resulting from naphtha cracking can range from 4 wt % to 10 wt % of the naphtha feed depending the on aromatic content of the naphtha and severity of cracking. The benzene coproduction in naphtha cracking is a coincidental production to ethylene, whereas in the present invention additional ethylene production is coincidental to benzene production. For C2/C3 cracking, any significant downstream alkylation process, such as for producing ethylbenzene, is likely to be deficient in benzene.

Ethane and propane feeds are common in North America and the Arabian Gulf. In these places, benzene produced from petroleum refining would be a major provider of the benzene needed for downstream alkylation processes while the C2/C3 feed will be the major source of ethylene.

In general, benzene of nitration grade, about 99.9 wt % along with other specifications, has been used for nearly all applications, including alkylation for producing ethylbenzene and cumene. As noted above, benzene consumed by nitration processes is under 5%. However, production of ethylbenzene by vapor phase processes as practiced in many locations would require benzene of a high purity level. In recent years, the concept of alkylation of impure benzene produced from pyrolysis gasoline with dilute ethylene in mixed phase alkylation has been proposed, for example, in U.S. Pat. Nos. 5,880,320, 5,977,423 and 6,252,126. The concept of using impure benzene to produce cumene was suggested in U.S. Pat. No. 6,177,600. U.S. Pat. Nos. 5,750,814 and 6,002,057 disclose laboratory scale evidence that catalysts such as zeolite beta or zeolite Y are suitable for mixed phase alkylation of a dilute benzene stream, such as 30 wt % at about 370° F. with dilute ethylene such as 20 vol %. Alkylation of impure benzene with propylene and heavy olefins is disclosed as well.

U.S. Pat. Nos. 6,177,600 and 6,252,126 disclose a method of recovering benzene with over 80% purity, and preferably over 92% purity, where the impure benzene to be used for production of either ethylbenzene or cumene. The impure benzene was formed by hydrotreating and fractionating pyrolysis gasoline, typically containing 30 wt % benzene. Methyl-cyclo-pentane, cyclohexane and di-methyl-pentates account for the bulk of the impurities. An article in May 99 issue of Hydrocarbon Processing entitled: "Integrate ethylbenzene production with an olefins plant" discusses that impurities could consist of 75% Cyclo —C6 and 25% of C7, mostly di-methyl-pentates. All of these C6/C7 components are known to form azeotropes with benzene, and thus separation of cyclohexane and di-methyl-pentanes by conventional fractionation is impossible.

The conventional method of benzene purification and separation from the above azeotropes is by aromatic extraction or extractive distillation processes, such as UOP's Sulfolane, Lurgi's Arosolvan, IFP's DMSO processes and Uhde's Morphylane extractive distallation process. These processes, which are known to be expensive, result in a high recovery of aromatics while producing benzene at purity of over 99.9 wt %. The purity of the benzene is an important issue if ethylbenzene is produced by a vapor phase process resulting in alkylation at about 750° F. Non-aromatic impurities could crack under these alkylation conditions and would potentially contaminate the ethylbenzene product with undesirable alkylates such as cumene. In recent years, the industry has been shifting its mode of alkylation from zeolite vapor phase or $AlCl_3$ liquid phase to zeolite liquid phase alkylation with either polymer grade pure ethylene or dilute ethylene. The dilute ethylene may come as a coproduct from ethylene production such as ethylene-ethane grade with 60–90 vol % ethylene or ethylene-hydrogen-methane grade at concentrations of 8 to 15 vol %. The dilute ethylene for alkylation could be from fluid catalytic cracking (FCC) refinery source as well. The estimated alkylation temperature ranges from 310° F. to 530° F., depending on ethylene concentration and alkylation pressure. Industry research seems to indicate that alkylation in this temperature range will not crack the assumed non-aromatic impurities in the benzene, resulting from the application of the present invention where the purified benzene is applied. This is even more the case for alkylation below 420° F. and if the impurities are the more stable cycloparaffins, such as methyl cyclopentane or cyclohexane. The conversion of vapor phase alkylation units to liquid or mixed phase alkylation is decreasing the portion of the benzene market where nitration grade or pure benzene is mandatory. This market shift is the major driving force behind the present invention.

As mentioned above, catalytic reforming of naphtha is a major source of production of aromatics, including benzene. Typically, a straight run, full range naphtha resulting from crude oil fractionation has a boiling range of 100 to 350° F. It is recovered as a side cut from atmospheric distillation, typically about 10 to 20% of the crude oil, depending on the boiling curve of the crude oil. This naphtha undergoes further fractionation to separate a cut point of below 200° F., light naphtha. The C7+ cut, typically 75% of the original naphtha cut, undergoes hydrodesulfurization to less than 1 ppm sulfur and is used as a feed for catalytic reforming. In the catalytic reforming, desulfurized naphtha undergoes catalytic and endothermic dehydrogenation at about 850 to 1000° F. and 60 to 75 psig in 3 to 4 successive reactors equipped with interstage reheating. Aside from some cracking to C1–C5, the bulk of the naphtha is converted to aromatics, about 70 wt %, depending on the severity and characteristics of the naphtha. The balance of reforming reactor effluent is C5–C8 non aromatics, of which about 60 to 75% are iso paraffins, including di methyl pentanes. Fractionation and production of benzene with over 75 wt % purity from reformer reactor effluent by conventional distillation may become difficult because of the azeotrope forming characteristics of compounds such as di-methyl-pentanes, cyclohexane and methyl-cyclo pentane. Production of ethylbenzene or cumene from 75 wt % benzene would result in a low benzene yield due to high purge rate that would be required for non aromatics. Consequently, this would result in marginal economics.

To illustrate the conventional fractionation issue the following is a brief summary of binary, benzene and C6/C7 paraffins azeotropic chracteristics in atmospheric pressure. Pure benzene boils at 80.1° C. and pure cyclohexane at 81.4° C.

Component	Benzene wt %	Azeotrope boiling temperature° C.
Cyclohexene	85	79.5
Cyclohexane	55	77.5
Methylcyclopentane	10	71.5
n-Hexane	5	69.0
2,4 Di-methyl-pentane	48.5	75.0
2,3 Di-methyl-pentane	79.5	79.0
2,2 Di-methyl-pentane	46.5	76.0
n-Heptane	99.3	80.0
Tri-methyl-butane	50.5	76.5

SUMMARY OF THE INVENTION

The present invention is directed to a process for the coproduction of purified benzene and ethylene. The method comprises providing a first mixture comprising benzene, toluene, and one or more C_6 to C_7 non-aromatics. This first mixture preferably comes from a refinery source, but can alternatively come from any other appropriate source. The majority of the benzene and the one or more C_6 to C_7 non-aromatics are separated from the majority of the toluene to form a second mixture containing benzene and at least a portion of the one or more C_6 to C_7 non-aromatics. Thereafter, at least about 80%, preferably at least about 95%, of the C_6 to C_7 non-aromatics in the second mixture are cracked while maintaining essentially no cracking of benzene to produce a cracked product containing ethylene, propylene and pyrolysis gasoline comprising C_5 to C_8 olefins, di-olefins and benzene. The pyrolysis gasoline is fractionated to form a purified benzene product comprising at least about 80 wt %, preferably at least about 98 wt %, benzene.

In accordance with the inventive method, stabilized reformate after C3/C4 and light ends removal proceeds to a deheptanizer column, producing overhead benzene rich fraction of about 100–210° F. boiling range and toluene rich as a bottom product. The key components of the fractionation are toluene, with an atmospheric boiling temperature of 231° F., and n-heptane, with an atmospheric boiling temperature of 200° F. The 100–210° F. fraction, which contains from about 12 to about 50 wt %, preferably from about 20 to about 35 wt %, benzene and essentially no toluene, xylenes and heavy C9+, aromatics, is introduced as a feed or a partial feed to a steam cracker. In accordance with the invention, the benzene in the feed goes unaffected through the cracker due to the_short residence time in the cracking coil in the furnace and without significant coking on the surface of furnace coil, which operates at about 1,525° F. This is different than_common feeds to naphtha crackers, which typically comprise 1–2 wt % benzene along with 3–5 wt % toluene, 0.5–1 wt % C8 aromatics and 3–5 wt % heavy, C9+ aromatics. It has been known that liquid feeds that are high in aromatics are more susceptible to coking than low aromatic feeds and would require more frequent decoking operations. However, benzene alone, as sole aromatic in the_feed, would not contribute to the coking associated with aromatics. It is known that the coking mechanism is driven by free radical and paraffinic chains on aromatics as well as multi ring aromatics. Therefore, benzene as such is presumed to be by far less reactive to coking. The introduction of benzene would slightly increase the firing duty in the cracking furnace and steam consumption to allow for evaporation and sensible heat losses. The pyrolysis gasoline C5–C8 cut that results from cracking this benzene rich material would be of over 75 wt % benzene, as opposed to 30 wt % benzene in normal pyrolysis gasoline. The balance contains 7 to 15 wt % toluene and C8 aromatics and 7 to 15 wt % C5 to C8 non aromatics. Downstream fractionation of the benzene results in about 98% recovery per pass, while over 90 wt % of other materials are separated, producing close to 98 wt % benzene. As noted, this benzene could be a raw material for production of ethylbenzene or cumene and perhaps even cyclohexane. The ethylbenzene could be used for production of styrene by either dehydrogenation or by coproduction of propylene oxide, which can further be polymerized to polystyrene, as is commonly known in the industry.

DESCRIPTION OF THE DRAWING

FIG. **1** is a flowchart illustrating one embodiment of the method of the invention where ethylbenzene and cumene are coproduced with olefins.

DETAILED DESCRIPTION

A particularly preferred embodiment of the invention is depicted in FIG. **1** and set forth below. Reformate from catalytic reforming, which is rich in benzene, toluene and C8 aromatics (Stream **1**), enters a deheptanizer column V-101 (**7**), along with hydrotrated and benzene-depleted pyrolysis gasoline (Stream **4**) resulting from ethylene production. The deheptanizer column (V-101) operates at about 20 psia at the overhead. Two products are formed in the deheptanizer columne, namely, benzene rich light reformate (Stream **2**) and toluene/xylene-rich heavy reformate (Stream **3**). The heavy reformate (Stream **3**) can be routed to an aromatics plant, which likely to include toluene conversion to additional benzene as well as xylenes recovery.

The benzene rich light reformate (Stream **2**) serves as a partial feed to the steam cracker (**1**), preferably a specially dedicated liquid cracking furnace if the rest of the feed comprises C2/C3. Raw materials for olefin product are also fed to the steam cracker (**1**), namely, a gas feed containing ethane and propane (Stream **5**) and a recycle stream (Stream **6**) from fractionation (**3**) that occurs later in the process, discussed further below, which also contains ethane and propane. Cracking of other liquid feeds, such as naphtha or gas oil, is also an option in accordance with the invention. One product from the steam cracker (**1**) is heavy pyrolysis fuel oil, which is separated from the cracking zone (Stream **8**) and passed to a quench oil system (not shown). Another product, cracked gas containing olefins, hydrogen, methane and C2 to C6 at about 5 to 10 psig (Stream **7**), is compressed in compressor coolers (**2**), preferably in 4 to 5 stages, to 400 to 600, preferably 520, psig, which includes intercooling, caustic wash and stripping of ethylene from the condensate. Almost all C6+ pyrolysis gasoline and much of the C5 are condensed in the compressor coolers. All light cracked material, including a portion of C5, are fractionated in a fractionation section (**3**), where ethylene (Stream **9**) is recovered by refrigerated fractionation and propylene (Stream **10**) and C4 mix (Stream **11**) are each recovered by warm fractionation. Hydrogen product (Stream **12**) as needed is separated from methane and CO by pressure swing adsorption (PSA). Methane rich fuel gas (Stream **13**) is recovered and routed as fuel to the steam cracker (**1**). An outside fuel gas header (not shown) provides any fuel deficiency or accepts any excess of fuel, depending on hydrogen recovery and the overall heat balance.

Pyrolysis gasoline, C5 to C8, (Stream **14**) from the compressor coolers (**2**) and C5 (Stream **15**) from the fractionation section (**3**) are hydrotreated in hydrotreater (**4**) by hydrogent stream (Stream **16**), and the resulting hydrotreated pyrolisis gasoline (Stream **17**) undergoes fractionation for benzene recovery in two columns. First the pyrolysis gasoline is introduced to the dehexanizer column (**5**) where C5, iso C6, n-C6 and most of methyl-cyclo-pentane in the feed are separated as a top cut (Stream **18**). The bottom product of the dehexanizer (**5**) which comprises benzene, cyclohexane, some methy-lyclo-pentane and almost all C7+ (Stream **19**), proceeds to a debenzenizer column (**6**) to produce a toluene rich cut (Stream **20**) and a benzene product (Stream **21**). The toluene rich cut (Stream **20**) combines with the top cut from the dehexanizer (Stream **18**) to form the hydrotrated and benzene-depleted pyrolysis gasoline (Stream **4**) that is fed to the deheptanizer V-101 (**7**). In a particularly preferred design, Streams **18** and **20** along with Stream **1** will enter the dehepanizer (**7**), which preferably has about 75 trays, at different tray locations.

The benzene product (Stream **21**) proceeds to ethylbenzene production (**8**), cumene production (**9**) and/or storage for export (**10**) to off plot users of non-nitration grade benzene. One of the assumed alkylation products would be a purge stream of C6/C7 rich hydrocarbon from cumene and ethylbenzene production (Streams **22** and **23**, respectively), which could optionally be recycled for full benzene recovery to deheptanizer (**7**) or directly to the cracker (**1**). The calculated benzene purity of benzene product is 98.35 wt % in this particular example, but can typically range from 98 to 99 wt %.

The calculated benzene production rate for this particular matieral balance is 50,000 lb/hr containing: about 0.3 wt % methyl-cyclo-pentanes, 0.6 wt % cyclohexane, 0.2 wt % n-hexane and 0.6 wt % C7, mostly di-methyl-pentanes, and 400 wt. ppm toluene

The following is an exemplary material balance, where the amounts are indicated in lb/hour:

	Stream -1	Stream -2	Stream-3	Stream-4
C_4H_{10}	1,370	1,520	0.0	150
C_5 mix	23,960	28,620	0.0	4,660
n-C_6H_{14}	12,750	13,200	10	460

-continued

I-C_6H_{14}	23,700	24,090	10	400
M-Cyclo C_5	740	1,235	5	500
Cyclo C_6	100	145	5	50
n-C_7H_{16}	11,750	10,730	1,180	160
I-C_7H_{16}	21,810	21,940	20	150
M-Cyclo C_6	220	65	235	80
Benzene	39,820	41,100	20	1,300
Toluene	128,820	670	132,030	3,880
P-Xylene	22,730	5	23,425	700
O-xylene	30,400	5	31,095	700
M-xylene	49,440	10	50,130	700
EB	21,450	10	22,190	750
C_8 NA	0	0	80	80
C_9 Aromatics	49,630	0	49,630	0
Total	438,690	143,345	310,065	14,720

	Stream 5	Stream 6	Stream 7	Stream -8
Hydrogen	0	0	13,650	0
CO	0	0	3,410	0
Methane	1,000	0	55,470	0
Acetylene	0	0	4,720	0
Ethylene	0	0	219,200	0
Ethane	183,750	94,500	94,200	0
MAPD	0	0	1,310	0
Propylene	0	120	30,350	0
Propane	91,000	6,825	6,820	0
C_4 mix	1,000	0	17,580	0
C_5	0	0	4,490	0
C_6	0	0	1,840	0
C_7	0	0	550	0
C_8	0	0	70	0
Benzene	0	0	51,340	0
Toluene	0	0	3,900	0
Xylene +EB	0	0	2,850	0
Heavy	0	0	0	10,080
Total	276,750	101,445	511,750	10,080

	Stream -9	Stream-10	Stream-11	Stream-12	Stream -13
Hydrogen	0	0	0	7,115	6,100
CO	0	0	0	10	3,400
Methane	10	0	0	10	55,460
Ethylene	223,500	0	0	0	700
Ethane	300	10	0	0	10
Propylene	30	31,250	50	0	0
Propane	0	120	0	0	0
C_4 mix	0	10	17,530	0	0
C_5	0	0	200	0	0
Total	223,830	31,380	17,780	7,135	65,670

	Stream -14	Stream-15	Stream 16	Stream-17
Hydrogen	0	0	280	0
C_4 mix	30	110	0	150
C_5 mix	3800	690	0	4,660
C_6 mix NA	1,800	40	0	1,920
C_7 mix NA	545	5	0	570
C_8 mix NA	70	0	0	70
Benzene	50,840	500	0	51,340
Toluene	3,890	10	0	3,900
Xylene	2,850	0	0	2,850
Total	63,915	1,355	280	65,460

	Stream -18	Stream-19	Stream-20	Stream 21
C_4 saturated	150	0	0	0
C_5 saturated	4,660	0	0	0
M-Cyclo C_5	500	150	0	150
Cyclo C_6	50	250	0	250
I-C_6	400	10	0	10
n-C_6	460	100	0	100
I-C_7	50	320	100	220
n-C_7	10	200	150	50
C_7 Napht	10	100	70	30

-continued

C_8 NA	0	70	70	0
Benzene	1,200	50,140	100	50,040
Toluene	10	3,890	3,870	20
C_8 aromatic	0	2,850	2,850	0
Total	7,500	58,080	8,190	50,870

What is claimed is:

1. A process for the coproduction of ethylene and purified benzene comprising:

providing a first mixture comprising benzene, toluene, and one or more C_6 to C_7 non-aromatics;

separating the majority of the benzene and the one or more C_6 to C_7 non-aromatics from the majority of the toluene to form a second mixture containing at least a portion of the benzene and at least a portion of the one or more C_6 to C_7 non-aromatics, wherein the second mixture is substantially free of hydrocarbons having more than nine carbons;

introducing at least a portion of the second mixture to a cracker and thereafter cracking at least about 80% of the C_6 to C_7 non-aromatics in the portion of the second mixture that has been introduced to the cracker while maintaining essentially no cracking of benzene to produce a cracked product containing ethylene, propylene and pyrolysis gasoline comprising olefins, di-olefins and benzene; and

fractionating the pyrolysis gasoline to form a purified benzene product comprising at least about 80 wt % benzene.

2. A process as claimed in claim **1**, wherein the purified benzene product comprises at least about 97 wt % benzene.

3. A process as claimed in claim **1**, comprising cracking at least about 95% of the C_6 to C_7 non-aromatics.

4. A process as claimed in **1**, further comprising alkylating at least a portion of the benzene in the purified benzene product with ethylene to form ethylbenzene.

5. A process as claimed in claim **4**, wherein the ethylene is introduced in a dilute ethylene mixture comprising ethylene in an amount ranging from about 60 to about 90 vol % and ethane.

6. A process as claimed in claim **4**, wherein the ethylene is introduced in a dilute ethylene mixture comprising methane, hydrogen and less than 20 mol % ethylene.

7. A process as claimed in claim **4**, further comprising converting at least a portion of the ethylbenzene to styrene.

8. A process as claimed in claim **7**, further comprising converting at least a portion of the styrene to polystyrene or a derivative thereof.

9. A process as claimed in claim **1**, further comprising alkylating at least a portion of the benzene in the purified benzene product with propylene to form cumene.

10. A process as claimed in claim **9**, further comprising converting at least a portion of the cumene to phenol.

11. A process as claimed in claim **1**, wherein the majority of the toluene, xylene and heavy aromatics are separated from the majority of the benzene and the one or more C_6 to C_7 non-aromatics by conventional fractionation in a distillation column.

12. A process as claimed in claim **1**, further comprising converting at least a portion of the toluene that has been separated from the benzene to additional benzene.

13. A process as claimed in claim **12**, wherein the toluene is converted to benzene by hydrodealkylation or by coproducing xylene.

14. A process as claimed in claim **12**, further comprising converting to ethylbenzene at least a portion of the benzene that was converted from toluene.

15. A process as claimed in claim **14**, further comprising converting at least a portion of the ethylbenzene to styrene.

16. A process as claimed in claim **15**, further comprising converting at least a portion of the styrene to polystyrene or a derivative thereof.

17. A process as claimed in claim **12**, further comprising converting to cumene at least a portion of the benzene that was converted from toluene.

18. A process as claimed in claim **17**, further comprising converting at least a portion of the cumene to phenol.

19. A process as claimed in claim **1**, further comprising hydrotreating the pyrolysis gasoline for saturation of the olefins and di-olefins.

20. A process as claimed in claim **1**, wherein the benzene is present in the second mixture in an amount ranging from about 12 wt % to about 50 wt %.

21. A process as claimed in claim **1**, wherein the benzene is present in the second mixture in an amount ranging from about 20 wt % to about 35 wt %.

22. A process as claimed in claim **1**, further comprising converting at least a portion of the benzene to cyclohexane.

23. As process as claimed in claim **12**, further comprising converting to cyclohexane at least a portion of the benzene that was produced by conversion of toluene.

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