United States District Court,
D. Delaware.

BASF CORPORATION,
Plaintiff.
v.
EASTMAN CHEMICAL CO,
Defendant.

No. Civ.A.95-746-RRM

March 24, 1998.

Josy W. Ingersoll, Young, Conaway, Stargatt & Taylor, Wilmington, Delaware; Richard L. Mayer, Richard L. DeLucia, Howard J. Shire, Lynne Darcy, and Charles A. Weiss, Kenyon & Kenyon, New York, New York; for plaintiff.

William J. Marsden, Jr., Joanne Ceballos, and Michael S. McGinniss, Potter, Anderson & Corroon, Wilmington, Delaware; Ralph A. Mittleberger, Barry E. Bretschneider, Howard Susser, and William R. Johnson, Fish & Richardson, P.C., Washington, D.C.; Frank P. Porcelli, and Ronald E. Myrick, Fish & Richardson, P.C., Boston, Massachusetts; R. Danny Huntington, B. Jefferson Boggs, Jr., Nhat D. Phan, and Todd R. Walters, Burns, Doane, Swecker & Mathis, LLP, Alexandria, Virginia; for defendant.

REVISED MEMORANDUM OPINION

SHAW, J.

This is a patent case. Plaintiff BASF Corporation ("BASF") owns U.S. Patent No. 5,034,545 ("the '545 patent"), which claims a process for the preparation of the chemical 2.5-dihydrofuran ("DHF") from the chemical epoxy I butene ("EpB"). BASF alleges that defendant Eastman Chemical Co.'s ("Eastman") process for the commercial production of DHF infringes claim 6 of the '545 patent, and that Eastman is wilfully infringing. Eastman has denied infringement, asserted the affirmative defense of invalidity on the grounds of priority of invention, and counterclaimed for a declaratory judgment of noninfringement and invalidity.

From October 14 to October 22, 1997, the court held a non-jury trial on the issues of infringement, willful infringement, and invalidity. At trial, BASF alleged that the process Eastman is using at its Longview, Texas plant to commercially prepare DHF infringes claim 6 of the '545 patent, and that Eastman is wilfully infringing claim 6. Eastman argues that it is not infringing claim 6 of the '545 patent, as the process it uses in Longview is not covered by claim 6. Furthermore, Eastman argues that claim 6 of the '545 patent is invalid on the grounds of priority of invention because experiments done by Eastman scientists before BASF filed the '545 patent application constitute prior reductions to practice of claim 6, and Eastman scientists disclosed the results of these experiments in a patent application filed in March 1990.

The following is the court's decision on these issues.

I. *FACTUAL AND PROCEDURAL BACKGROUND*

The court draws the following facts from the pre-trial order and from the evidence presented at the trial.

A. *The Technology*

The technology at issue in this matter involves the preparation of DHF from EpB. DHF is a solvent and starting material that can be used to make products such as Spandex and other products in the plastics industry. EpB is a compound with negligible commercial value. Through a chemical process known as catalysis, EpB can be transformed to DHF. Catalysis is the action of a catalyst, a substance which alters the rate of a chemical reaction without being depleted in the process. The catalyst creates a reaction that rearranges the manner in which the atoms that make up EpB are bound together, without altering the number of atoms. Because EpB can create end products other than DHF, the catalyst used for this rearrangement is critical to the process.

Scientists have explored many different methods for the catalytic rearrangement of EpB to DHF. In January 1976, the Patent and Trademark Office ("PTO") issued U.S. Patent No. 3,932,468 ("the Kurkov patent") to the Chevron Research Company. The Kurkov patent discloses a process for producing DHF using a catalyst of "hydrogen iodide or bromide and a homogenous transition metal compound in an organic solvent." In December 1976, the PTO issued U.S. Patent No. 3,996,248 ("the Wall patent") to Chevron. The Wall patent discloses a process for producing DHF using a catalyst of "hydrogen halide selected from the group consisting of hydrogen iodide or bromide and a Lewis acid."

Both processes claimed by the Kurkov and the Wall patents are solvent-based. One significant disadvantage of solvent-based processes is the need to remove the DHF from the reaction mixture through a distillation process. Distillation constitutes a separate step of the recovery process, and renders the process less efficient and less economical. Thus, during the 1980's, scientists at BASF and Eastman sought to create alternative catalyst systems for converting EpB to DHF without the disadvantages associated with the use of large amounts of solvent. The dates on which these scientists discovered and reduced to practice certain catalyst systems is integral to the dispute between BASF and Eastman.

B. ***The*** '545 Patent

On May 23, 1990, BASF Aktiengesellschaft ("BASF AG"), a German corporation, filed a patent application with the PTO, which matured into the '545 patent. The PTO issued the '545 patent on July 23, 1991. Martin Fischer, the named inventor, assigned the '545 patent to BASF AG, which subsequently assigned it to BASF.

In August 1989, approximately one year before filing the '545 patent application, BASF AG filed an application in Germany. The '545 patent application claimed priority to the German application, which means that the '545 patent application received the benefit of the earlier filing date of August 8, 1989. *See* 35 U.S.C. s. 119 (1997).

The '545 patent teaches that the catalytic rearrangement of EpB can occur using a three part catalyst system at a temperature between 60 (deg.) and 200 (deg.) Celcius. This catalyst system includes component A, which "is a halide of an alkali metal or alkaline earth metal or an onium halide." Component A is the active ingredient that starts the reaction with the EpB. Component B dissolves component A so that it can mix with the liquid solution during catalysis. Component B "is an organic solubilizer for component A." Component C "is a Lewis acid or elemental iodine."

The original application for the '545 patent included five claims. Claim 1 of the patent claimed a process for the preparation of DHF from EpB which

comprises the rearrangement being catalyzed by a system which contains components A, B and C, at from 60 (deg.) to 200 (deg.) C., where

A is a halide of an alkali metal or alkaline earth metal or an onium halide.

B is an organic solubilizer for component A, and

C is a Lewis acid or elemental iodine,

with the proviso that at least one of components A or C is an iodide.

Claims 2 to 5 depended from claim 1.

The original application for the '545 patent included a discussion of the amount of component B necessary to dissolve component A. As noted in the patent application, "the amount of solubilizer B required to solubilize component A greatly depends on the particular substance." The patent application also noted that onium halides, which may be used as component A, have a "certain intrinsic solubility in the organic reaction medium." Accordingly, the solubility of the "onium halides with four alkyl or aryl substituents may be so great in the reaction medium that virtually no addition of solubilizer B is necessary." This language, which constituted part of the original application filed with the PTO, is included at column 4, lines 36 to 58 of the '545 patent.

On November 6, 1990, during the prosecution of the '545 patent, the patent examiner relied on the language in the patent specification, and noted that solubilizer may not be necessary when certain halides are used as component A. The examiner noted that "this 'no solubilizer' embodiment is intended to be covered by the claims." Thus, the examiner suggested what eventually became claim 6 of the '545 patent.

On January 24, 1991, BASF AG added amended claim 6 to the '545 patent. Claim 6 limits component A to onium halides that are "substantially soluble in the reaction medium," Claim 6 claims a process for the preparation of DHF from EpB which

consists essentially of the rearrangement being catalyzed by a system which contains components A and C from 60 (deg.) to 200 (deg.) C where A is an onium halide, which is substantially soluble in the reaction medium, and C is a Lewis acid or elemental iodine with the proviso that at least one of the components A or C is an iodide.

C. *Eastman's Catalytic Rearrangement*

In the 1980's, Eastman scientists were also experimenting with different catalyst systems for converting EpB to DHF. In particular, three scientists focused their studies on the catalytic rearrangement of EpB --- Dr. Stephen Falling, Dr. John Monnier, and Dr. Howard Low.

In January 1987, Monnier notified Dr. Windell Watkins that he had discovered a process for cheaply manufacturing EpB from butadiene. Watkins invited Monnier to come from Eastman's Rochester, New York plant, to its Longview. Texas plant to give a seminar on his research on converting butadiene to EpB. On February 24, 1987, Watkins wrote a memo to Monnier and Steve Godleski, another research scientist at Rochester, indicating an interest in working with scientists at the Rochester plant to "develop a process for epoxy-butene and ... to develop some other chemicals that are easily derived from EpB."

As a result of Watkins' memo, in December 1987, Eastman scientists held a meeting at the Rochester plant to discuss whether to convene a team to develop a process for preparing EpB and EpB derivatives. Following the meeting, the scientists created an EpB team comprised of, among others, Watkins, Godleski, Monnier, Low, and Falling. Watkins headed the EpB team. Although the scientists did not all work at the same Eastman plant, they kept one another informed of the results of their experiments. For example, beginning in the summer of 1988 and continuing through the end of 1990, Falling circulated monthly reports to other members of the EpB team documenting the progress of his experiments.

1. *Falling's Monnier's, and Low's experiments*

In June 1988, Falling began to explore different processes for catalytically rearranging EpB to DHF. Falling's experiments always included EpB in liquid form. At trial, Falling testified about some of the experiments he conducted.

On June 9, 1988, Falling catalytically rearranged EpB to DHF by mixing a Lewis Acid (zinc chloride), an onium halide (tetrabutylammonium iodide), a solvent (toluene), and EpB at 100 (deg.) C, resulting in 4.4% DHF. On June 15, 1988, Falling mixed a Lewis acid (zinc chloride), an onium halide (tetrabutylammonium iodide), a solvent (toluene), and EpB at 150 (deg.) C. The end product was 21.2% DHF.

On June 28, 1988, Falling attempted an experiment with a different Lewis acid (zinc iodide), an onium halide (tetrabutylammonium iodide), a solvent (toluene) and EpB at 150 (deg.) C. Two days later, Falling ran a similar experiment, using dioxane instead of toluene. The result was 92.3% DHF. At trial, Falling noted that "[t]his experiment was very successful. It showed even greater amounts of DHF" than the prior experiments.

On July 6, 1988, Falling conducted a "neat" experiment. An experiment is neat when neither solubilizer nor solvent is added. Falling obtained DHF by mixing EpB with only a Lewis acid (zinc iodide) and an onium halide (tetrabutylammonium iodide) at 66 (deg.) to 70 (deg.) C. This catalyst combination produced 71.2% DHF. Two days later, on July 8, 1988, in a monthly report from Falling to Watkins and other members of the EpB team, Falling reported that the "best catalyst system studied thus far is [zinc iodide / tetrabutylammonium iodide,]" which included the neat experiment, and the earlier experiment with dioxane. Falling also reported that "[r]uns without solvent or in dioxane have been the most encouraging with regard to DHF/crotonaldehyde ratios. These runs appear to be clean and go to complete conversion of EpB."

Falling continued to experiment with various Lewis acids, onium halides, and solvents to obtain DHF. Falling also conducted more neat experiments. On July 18, 1988, Falling conducted a neat experiment, using tetrabutyltin iodide and tetrabutylphosphonium iodide at 66 (deg.) to 70 (deg.) C. Only trace amounts of

DHF were detected, and Falling discarded the experiment. Falling concluded that "some reaction had occurred" and that "these conditions were not optimum for this particular reaction." On July 27, 1988, Falling conducted another neat experiment, using magnesium iodide and tetrabutylammonium iodide at 66 (deg.) to 70 (deg.) C, resulting in a trace amount of DHF. Falling discarded this experiment. Falling testified at trial that 66 (deg.)> to 70 (deg.) C is "just too low a temperature to achieve very much reaction," and that if he had run the experiment at a higher temperature, he predicted that he "would obtain much more reaction."

On October 3, 1988, Falling successfully produced 71.7% DHF when he mixed a Lewis acid (tributyltin iodide), an onium halide (tetrabutylphosphonium iodide), and a solvent (toluene), at 150 (deg.) C.

In most of the above experiments, except the neat experiments, Falling used a solvent. At trial, Falling testified that he used toluene as the solvent because EpB was in short supply and he had to conserve it, and "toluene had the purpose of diluting the mixture so as to cut down polymerization chemistry and to favor the rearrangement reaction."

Falling continued to experiment with various catalyst combinations throughout 1989 and 1990, circulating monthly reports documenting his progress. In an August 1, 1989 memo sent to members of the EpB team Falling wrote that "[t]he screening of catalyst systems for the homogenous rearrangement of EpB to 2,5-DHF is still in progress."

At the same time that Falling worked on developing a process for converting EpB to DHF, Monnier and Low were also experimenting with various catalysts. Because of the equipment capabilities at the Rochester plant, all of their experiments were gas feed, which meant that they used EpB in gas form.

Monnier and Low testified at trial that they initially used metallic iodides as a catalyst. However, Watkins thought that Falling's use of an onium halide and a Lewis acid as a catalyst constituted a major breakthrough for converting EpB to DHF. Thus, from November 1988, to January 1990, Monnier and Low conducted several experiments using this catalyst to rearrange EpB to DHF. The experiments were run at approximately 110 (deg.) to 185 (deg.) C. Low testified that the conversion to DHF was "pretty successful" when they used onium halides and a Lewis acid.

2. *The patent applications*

On March 8, 1990, Eastman filed U.S. Patent Application Serial No. 07/490,208 ("the '208 application") which claimed a process for the catalytic rearrangement of EpB to DHF by mixing a Lewis acid and an onium halide. This process used neither a solubilizer nor a solvent at a temperature range of 60 (deg.) to 225 (deg.). The '208 application was mainly based on the gas feed, liquid phase catalyst work done by Monnier and Low. Although the '208 application generally covered Falling's work, it did not include any working examples from Falling's notebooks, and Falling was not listed as an inventor on the application. Eastman filed the '208 application approximately two and a half months before BASF filed the '545 application.

On July 23, 1990, Falling and Patricia Lopez-Maldonado, a scientist working with Falling since July 1989, completed an invention report and submitted it to Eastman's patent department. The report stated that "[a] catalytic process has been discovered with the rearrangement of vinyl epoxides to 2,5-dihydrofurans in good yield and selectivity. The process comprises contacting a vinyl epoxide [EpB] with a catalytic amount of an organotin or organoantimony compound and an organic-soluble iodide or bromide salt in an inert solvent at elevated temperatures." Organotins or organoantimony compounds are Lewis acids.

The report also stated that the "process is an improvement over the prior art in that it does not require the use of corrosive hydrogen halides or expensive tertiary amide solvents." The report stated that "[a]lthough the rearrangement reaction can be performed in the absence of solvent, the use of an inert organic solvent or diluent is normally preferred for ease of materials handling. The vinyl epoxide rearrangement can be performed in any solvent which is unreactive towards epoxides and the catalysts."

This invention report became the basis for a December 14, 1990 addendum to the '208 application, a continuation in part ("CIP"). The CIP added to the '208 application working examples of the liquid phase experiments using a catalyst system of an onium halide and a Lewis acid that Falling had worked on during the summer of 1988. Because the CIP contained some new subject matter, the new subject matter had its own filing date of December 14, 1990.

Eastman filed the CIP as a new patent application, U.S. Application Serial No. 627,668 ("the '668 application"). The '668 application disclosed a process for converting EpB to DHF using a catalyst of an onium halide and a Lewis acid, and no solubilizer. Eastman eventually abandoned the '208 application in favor of the '668 application. The '668 application matured into U.S. Patent No. 5,082,956 ("the '956 patent"), which the PTO issued to Eastman on January 21, 1992. Monnier, Godleski, Low, and Gerald W. Phillips, a scientist at the Longview plant, are listed as inventors. The '956 patent discloses a process for converting EpB to DHF where the "catalyst may comprise a supported catalyst, an unsupported catalyst or a solution of the catalytically-active components in an inert, organic solvent."

During the early to mid-1990's, Eastman filed other patent applications as Eastman scientists continued experimenting with processes for catalytically rearranging EpB into DHF. On February 10, 1994, Eastman filed U.S. Application Serial No. 08/194,655 ("the '655 application"), which claims a process for the catalytic rearrangement of EpB to DHF using a catalyst system of an onium halide and a Lewis acid. Falling is listed as the inventor on the '655 application.

The '655 application is a continuation in part of Application Serial No. 07/746,530, which was filed in August 1991, and which is a divisional application of the '668 application. The divisional application is based on the parent application, the '668 application, and it has the same specifications but different claims. The divisional application is entitled to the filing date for the '668 application, December 14, 1990. The '655 application is still pending.

On May 24, 1994, the PTO issued U.S. Patent No. 5,315,019 ("the '019 patent") to Eastman. Phillips, Falling, Monnier, and Godleski are listed as the inventors. The '019 patent discloses a "continuous process for the manufacture of [DHF] by the isomerization of [EpB] in the liquid phase in the presence of a catalyst system comprising an onium iodide compound and a Lewis acid and a process solvent comprising a mixture of the [DHF] product of the process and an oligomer of the [EpB] reactant." Thus, the '019 patent discloses a process in which the onium halides are intrinsically soluble in the reaction medium, which essentially eliminates the need for added solvent.

At column 2, line 60, to column 3, line 3, the '019 patent states that the "[a]dvantages provided by the continuous process disclosed herein include milder reaction conditions, simplified product separation and the ability to remove and replenish the catalyst system." Additionally, the "use of a mixture of the [DHF] product and an oligomer of the [EpB] reactant as the inert process solvent allows the reaction to be run at temperatures substantially lower than those used in vapor phase processes," and "[a]s a result, the potential for catalyst deactivation or decomposition and by-product formation is decreased."

D. *The Interference*

On November 3, 1994, the PTO declared an interference between claims 1 to 6 of BASF's '545 patent and Eastman's pending '655 application. (*Monnier et al. v. Martin Fischer,* Interference No. 103,455). The PTO declared the interference for the purpose of determining whether BASF or Eastman first catalytically rearranged EpB to DHF using a catalyst system of an onium halide and a Lewis acid.

On November 29, 1995, Administrative Patent Judge Marc L. Caroff declared unpatentable claims 1 to 5 of the '545 patent because example 6 of the Wall patent disclosed a process for the preparation of DHF from EpB using a catalyst system that anticipated claims 1 to 5. Judge Caroff also determined that claim 6 of the '545 patent is directed to the same invention Eastman claims, and that if Eastman's application matures into a patent, claim 6 of the '545 patent will be declared invalid on the basis of Eastman's priority of invention.

The interference proceedings are still pending.

E. *The Longview Process*

Eastman is currently working on a method for commercially producing DHF from its plant in Longview, Texas. At Longview, Eastman commences the process of catalytically rearranging EpB to DHF using a specific onium halide, THF (tetrahydrofuran), which is a solubilizer, and a specific Lewis acid, at 70 (deg.)> to 117 (deg.) C. Gerald Butler, a chemical engineer at Eastman, testified at trial about the Longview process.

At start-up, there is a one-to-one ratio of the onium halide to THF. The THF is added to the EpB to help dissolve the onium halide. Within six to twelve hours of adding both products distillation begins, and shortly thereafter a large portion of the THF is removed. The DHF produced soon outweighs the THF, and THF becomes less important to carry out the reaction. Eventually, no THF is left in the system.

When the EpB is added to the mixture of onium halide, THF, and Lewis acid, and DHF is produced, approximately 3% of the EpB is converted to oligomer. Eastman's expert in organic chemistry, Dr. John Swenton, testified at trial that the textbook definition of oligomer is a "substance composed of molecules containing a few of one or more species of atoms or groups of atoms ... repetitively linked to each other." As the DHF is produced, it is stored separately, and the oligomer is recycled back into the system to convert EpB to DHF. The oligomer is eventually built up to where it constitutes a substantial proportion of the system. The oligomer replaces the solubilizing function of the THF at start-up and helps keep the onium halide in a liquid state. The oligomer is inherently produced during the reaction. By recycling the oligomer back into the process to act as a solubilizer, the process can be run for months at a time.

F. *The Lawsuit*

On December 7, 1995, BASF filed a complaint alleging that the Longview process infringes claim 6 of the '545 patent, and that Eastman is wilfully infringing. On January 12, 1996, Eastman filed an answer denying infringement, asserting the affirmative defense of invalidity on the grounds of priority of invention, and counterclaiming for a declaratory judgment of noninfringement and invalidity.

On April 15, 1997, Eastman filed a motion for leave to amend its answer and counterclaim and to add

BASF AG as a party. Eastman sought to add several affirmative defenses, including the affirmative defenses of fraud, inequitable conduct, and unclean hands. Eastman also sought to add additional counterclaims, including a counterclaim for unfair competition pursuant to Delaware common law and statutory law, and counterclaims for a declaratory judgment that the '545 patent is unenforceable because of inequitable conduct, and that BASF is guilty of unclean hands. On July 31, 1997, the court granted Eastman's motion.

From October 14 to October 22, 1997, the court held a non-jury trial on the issues of infringement, willful infringement, and invalidity. At trial, BASF argued that the "virtually solvent-free process" which Eastman uses at Longview infringes claim 6 of the '545 patent. Furthermore, BASF argued that Eastman knew about the '545 patent before it commenced the production of DHF at Longview. Eastman argued that the Longview process does not infringe because of the use of a solubilizer, THF, at start-up, and the continuous use of a solubilizer, recycled oligomer, throughout the process. Furthermore, Eastman argued that Falling's neat experiments and his experiments using toluene as an inert solvent, and the gas feed work of Monnier and Low establish priority of invention. Therefore, Eastman argued that claim 6 of the '545 patent is invalid. *See* 35 U.S.C. s. 102(g) (1997). BASF argued that if these experiments establish prior inventorship, claim 6 is not invalid because Eastman abandoned, suppressed, or concealed this work.

On November 24, 1997, the parties stipulated that resolution of all other issues would be stayed pending the court's decision on infringement, willful infringement, and invalidity.

II. *DISCUSSION*

Before the court can decide the issues of infringement, willful infringement, and invalidity, the court must first construe the language of claim 6 of BASF's '545 patent.

A. *Claim Construction*

The court construes claims from the vantage point of a person of ordinary skill in the art at the time of the invention. *See* Markman v. Westview Instruments, Inc., 52 F.3d 967, 986 (Fed.Cir.1995) (*en banc*), *aff'd,* 116 S.Ct. 1384 (1996). However, the court may interpret a term in a patent claim to have a meaning other than the one a person of ordinary skill in the art would give it if it is apparent from the patent and the prosecution history that the inventor intended a different meaning. *See* Hoechst Celanese Corp. v. BP Chems. Ltd., 78 F.3d 1575, 1579 (Fed.Cir.), *cert. denied,* 117 S.Ct. 275 (1996).

In construing a claim, the court looks first to the intrinsic evidence of record, namely, the language of the claim, the specification, and the prosecution history. See Insituform Tech. Inc. v. Cat Contracting, Inc., 99 F.3d 1098, 1105 (Fed.Cir.1996). The claim language itself defines the scope of the claim, and "a construing court does not accord the specification, prosecution history, and other relevant evidence the same weight as the claims themselves, but consults these sources to give the necessary context to the claim language." Eastman Kodak Co. v. Goodyear Tire & Rubber Co., 114 F.3d 1547, 1552 (Fed.Cir.1997). Expert testimony may be considered if needed to assist the court in understanding the meaning or scope of technical terms in a claim. *See* Hoechst, 78 F.3d at 1579. However, reliance on any extrinsic evidence is improper where the claims, specification, and file history unambiguously define the scope of the claim. *See* Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583 (Fed.Cir.1996).

Although the Court of Appeals for the Federal Circuit has held that claims should be read in light of the specification, id. at 1582, the court has repeatedly cautioned against limiting the scope of a claim to the preferred embodiment or specific examples disclosed in the specification. *See e.g.,* Ekchian v. Home Depot, Inc., 104 F.3d 1299, 1303 (Fed.Cir.1997); *see also* Intervet America, Inc. v. Kee-Vet Laboratories, Inc., 887 F.2d 1050, 1053 (Fed.Cir.1989) (explaining that it is "improper" to read an extraneous limitation from the specification into the claim).

Claim 6 of BASF's '545 patent is the only claim at issue in this case. Claim 6 claims a process for the catalytic rearrangement of EpB to DHF

which consists essentially of the rearrangement being catalyzed by a system which contains components A and C from 60 (deg.) to 200 (deg.) C where A is an onium halide, which is substantially soluble in the reaction medium, and C is a Lewis acid or elemental iodine with the proviso that at least one of the components A or C is an iodide.

BASF and Eastman dispute the meaning of two phrases of claim 6. They dispute the meaning of "consists essentially of," and "substantially soluble in the reaction medium."

1. *What Does "Consists Essentially Of" Mean?*

BASF argues that the phrase "consists essentially of" means virtually solvent free, and therefore, a small amount of component B, solvent or solubilizer, can be present in the reaction. Eastman argues that "consists essentially of" precludes the use of component B, solubilizers.

BASF argues that the terms solvent and solubilizer are synonymous, that component B includes both terms, and that claim 6 permits the addition of small amounts of either. Eastman distinguishes between the terms, arguing that solvents and solubilizers perform different functions, that component B encompasses solubilizers only, and that claim 6 excludes the addition of component B. Accordingly, before the court construes whether the phrase "consists essentially of" permits the addition of component B, the court must determine whether component B includes both solvents and solubilizers.

The patent describes component B as an organic solubilizer. At column 2, lines 61 to 66, the patent specification explains that because the only requirements that component B has to meet are "bringing about the dissolution of component A and otherwise being stable and inert under the reaction conditions, a large number of substances can be used as component B." Column 2, line 66 to column 3, line 50 of the '545 patent gives examples of solubilizers that can be used in the catalyst system, including dioxane, tetrahydrofuran, and certain podands. Thus, the patent defines a solubilizer as an element which dissolves component A.

Column 3, line 68, of the patent discusses certain inert solvents, explaining that specific solvents can be used "for diluting the reaction mixture." The patent specification also gives examples of solvents that can be used for this purpose, including toluene and xylene. Thus, the patent defines a solvent as an element which dilutes the reaction mixture. Accordingly, the patent distinguishes between solubilizers and solvents, teaching that a solubilizer makes component A more soluble in the reaction medium, while a solvent dilutes the reaction medium.

Furthermore, during the prosecution of the '545 patent, BASF's patent attorney specifically distinguished between solubilizers and solvents, emphasizing that "organic solubilizers" are distinct from solvents. The attorney wrote to the PTO:

The term "organic solubilizer" is also carefully defined by the Fischer ['545] specification as being 'complexing agents for the salts A' or closely equivalent complexing solvents. This "organic solubilizer" is *not* an "inert solvent" such as those listed in col. 3, lines 64-68, including xylene and toluene, etc. Fischer makes it quite clear that such "inert solvents" are *not* suitable as an organic solubilizer but may be optionally added as a diluent.

Thus, the court concludes that solvents and solubilizers have distinct meanings and that component B, an "organic solubilizer," includes solubilizers only.

The court must now determine what the phrase "consists essentially of" means, and whether it permits the addition of component B. The phrase "consists essentially of" is not unique to the '545 patent. The Federal Circuit has stated that the "limited phrase 'consisting essentially of" ' does not "exclude the addition of another ingredient which does not materially affect the characteristics of the invention." Water Techs. Corp. v. Calco, Ltd., 850 F.2d 660, 666 (Fed.Cir.1988). The Federal Circuit has also stated that "consists essentially of" does "close the claims to other ingredients that do alter the basic and novel characteristics of the invention." *Neville Chem. Co. v. Resinall Corp.,* Nos. 90-1015 & 90-1034, 1990 WL 135903, at *1 (Fed.Cir. Sept. 20, 1990).

The '545 patent originally included six claims. Claims 1 to 5 all included component B, an organic solubilizer, as an essential element of the catalyst system. Component B's role in the catalyst system was to bring component A into solution. Claim 6, however, covered a catalyst system in which component A, an onium halide, is "substantially soluble," thereby eliminating the need for an organic solubilizer. The patent specification refers to onium halides as having an "intrinsic solubility." If something is intrinsically soluble, it is inherently capable of dissolving and does not need an additional component to put it into solution. Because the court defines solubilizer as an element that makes component A soluble, it follows that something that is intrinsically soluble does not need a solubilizer to help it dissolve.

The patent specification also states that certain onium halides are soluble enough such that "virtually no addition of solubilizer B is necessary." BASF argues that "virtually no addition" means that some solubilizer B can be added. However, this statement must be read in connection with the following sentence which states that "[a] procedure of this type [with virtually no addition of solubilizer] is equivalent to the claimed process." This language was part of the patent specification prior to the addition of claim 6. Thus, the "claimed process" referred to is the process covered by claims 1 to 5, in which the addition of solubilizer, regardless of how little, constituted a basic and novel characteristic of the process.

During the prosecution of the original '545 patent application, which included claims 1 to 5 only, the patent examiner relied on the specification language when he noted that solubilizer may not be necessary when certain halides are used as component A. On November 6, 1990, the examiner suggested what eventually became claim 6 of the '545 patent when he wrote that "this 'no solubilizer' embodiment is intended to be covered by the claims."

As noted above, one of the "basic and novel characteristics" of claim 6 is that component A is "intrinsically soluble." Because it is "intrinsically soluble" component B does not need to be added to make it soluble. In fact, the reason BASF eventually added claim 6 was because of the patent examiner's recognition that certain onium halides do not need the addition of component B to bring them into solution. BASF even admits this, stating in their argument that "[a] basic and novel characteristic of claim 6 is that it is a catalytic process for converting EpB to DHF which can be carried out virtually neat." Therefore, the addition of component B, a solubilizer, is not necessary and would alter this inherent trait.

Accordingly, the court concludes that the phrase "consists essentially of" excludes the addition of any component B, a solubilizer.

2. *What Does "Substantially Soluble in the Reaction Medium" Mean?*

BASF argues that the phrase "substantially soluble in the reaction medium" can be construed in three different ways.

First, BASF argues that the term "reaction medium" is not limited only to the EpB reactant and the DHF product, and that the "reaction medium" includes the chemical components of the reaction or by-products of EpB, such as oligomer. Eastman argues that "reaction medium" means only the EpB reactant and DHF product.

Second, BASF argues that "substantially soluble in the reaction medium" means that small amounts of solubilizer or solvent can be added. Eastman argues that the phrase "substantially soluble in the reaction medium" means that no solubilizers need to be added.

Third, BASF argues that the phrase "substantially soluble in the reaction medium" only includes a liquid-phase homogenous process, which means a liquid EpB feed, liquid catalysts, and liquid end products. Eastman argues that the phrase does not preclude a process in which EpB is fed in gas form, the catalyst system is liquid, and the end product is in gas form, because having catalysis in a liquid phase is the only phase-related limitation implicit in claim 6.

a. *Does the term "reaction medium" include only EpB and DHF?*

At column 2, lines 56 to 61 of the '545 patent, the specification states that "[c]omponent B of the catalyst system must, because it acts as solubilizer for component A. be chosen such that the particular salts A dissolve in the reaction medium, i.e. in particular in the alkenyloxirane II and in mixtures thereof with the dihydrofuran I which are produced during the reaction." This is the only place in the patent where "reaction medium" is described. Because the language of the patent itself is not clear as to the definition of "reaction medium," the court will turn to the prosecution history for a definition of the term "reaction medium."

During the prosecution of the '545 patent, BASF attorneys defined reaction medium as EpB and DHF alone, when they wrote about limiting component A to an onium halide " 'which is substantially soluble in the liquid reaction medium,' i.e. in the epoxy-butene [EpB] itself or its dihydrofuran [DHF] product." BASF attorneys also wrote that "Fischer Claim 6 is applicable only to those onium halides which are *substantially soluble* in the liquid epoxybutene or its products. Otherwise it would be necessary to add the organic solubilizing component B as in Fischer Claim 1." Furthermore, the "advantage of the process of Fischer Claim 6 is that no other solvent is required except the liquid epoxyalkene reactant itself (or its products) as the solvent capable of acting as the organic solubilizer for the onium halide catalyst to produce a single homogenous liquid phase."

Accordingly, the prosecution history demonstrates that the reaction medium consists of the EpB and the DHF only.

b. *Does the phrase "substantially soluble in the reaction medium" include the addition of solubilizer?*

BASF argues that because component A, the onium halide, need only be "substantially soluble," some solubilizer can be added. However, there is no evidence that the patent requires that all of component A dissolve. Rather, the patent focuses on the reaction that occurs during the catalytic rearrangement of EpB to DHF. Thus, the onium halide need only be soluble enough for catalysis to occur. Thus, "substantially soluble" does not mean that some solubilizer must be added to dissolve any remaining portion of component A.

Additionally, as noted above, the language used in the prosecution history also demonstrates that the phrase "substantially soluble in the reaction medium" means that no solubilizer is necessary. During the prosecution of the '545 patent, BASF attorneys contended that the language "substantially soluble in the liquid phase reaction medium" constitutes "an essential limitation which omits any need for a third component which is *an organic solubilizer* B as set forth in Fischer Claim 1." Furthermore, BASF wrote that "[c]laim 6 was added to the Fischer U.S. application to provide separate and explicit protection for this two-component catalyst system in the liquid phase reaction." This language makes it clear that claim 6 does not include the addition of any solubilizer.

Accordingly, the court concludes that the phrase "substantially soluble in the reaction medium" excludes the addition of any solubilizer.

c. *Does the phrase "substantially soluble in the reaction medium" exclude gas feed processes?*

As noted above, claim 6 precludes the addition of solubilizer because component A. the onium halide, is soluble enough for catalysis to occur without the addition of component B. Because component A is soluble it is capable of being dissolved, and if it is dissolved, it is in a liquid state. Therefore, if a required element of claim 6 is that component A is soluble in the reaction medium, it necessarily follows that the catalyst system must be in liquid phase.

Aside from the requirement that the catalyst system be in liquid phase, claim 6 does not impose any additional limitations on the form in which the catalytic rearrangement occurs. Rather, because claim 6 describes the catalyst system, and the reaction medium, it addresses the point at which catalytic rearrangement occurs, not any time before or after. Accordingly, there is no limitation on whether the EpB is added in gas form, or the DHF is removed as a gas, so long as the conversion from EpB to DHF occurs in a liquid phase. This comports with the court's construction of the term "reaction medium" to mean only EpB and DHF, as component A must be in liquid form as the EpB converts to DHF.

The court concludes that the only phase-related requirement of claim 6 is that the reactant and the catalyst are dissolved in the same liquid phase. Therefore, the phrase "substantially soluble in the reaction medium" does not exclude gas feed processes. Rather, it only means that the catalysis must occur in a liquid phase.

B. *Infringement*

BASF argues that Eastman's production of DHF at Longview infringes claim 6 of the '545 patent, and that Eastman is wilfully infringing. Eastman argues that it is not infringing.

1. *Does The Longview Process Infringe Claim 6 Of* The '545 Patent*?*

Section 271(a) of the Patent Act states that "whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent." 35 U.S.C. s. 271(a).

BASF argues that the Longview process infringes claim 6 of the '545 patent because Eastman catalytically rearranges EpB to DHF using a virtually solvent free process including a catalyst system of a Lewis acid and an onium halide which is "substantially soluble in the reaction medium" in a specific temperature range. Thus, BASF argues that the Longview process meets every element of claim 6. Eastman argues that claim 6 excludes the addition of solubilizer, and because the Longview process includes the addition of solubilizer Eastman is not infringing.

The Longview process begins with a catalyst system including onium halide, THF, and Lewis acid. The purpose of adding the THF to the EpB is to help dissolve the onium halide. Accordingly, consistent with this court's definition, THF acts as a solubilizer because its purpose is to dissolve component A, the onium halide. The '545 patent specification identifies THF as a solubilizer at column 3, line 59. Thus, at startup the Longview process does not infringe claim 6 of the '545 patent because of the addition of a solubilizer. However, BASF argues that because the THF is promptly removed from the system, the Longview process *is* run solubilizer-free and therefore, infringes claim 6.

As the THF is removed from the system, and the DHF is produced, approximately 3% of the EpB is converted to oligomer. Eastman builds up the oligomer to where it constitutes a substantial proportion of the system, and recycles it back into the system. The purpose of the oligomer is to help keep the onium halide in a liquid state. Accordingly, consistent with this court's definition, the oligomer acts as a solubilizer. Dr. George W. Gokel, Eastman's chemistry expert, testified at trial that the oligomer used in the Longview process is a podand. At column 3, lines 36 to 51, of the '545 patent, podands are identified as solubilizers. Thus, the Longview process is run with the continuous addition of solubilizer.

The court determined that claim 6 of the '545 patent precludes the addition of solubilizer. The Longview process uses two different solubilizers, THF and oligomer, in the production of DHF. Accordingly, the Longview process does not infringe claim 6 of the '545 patent.

2. *Is Eastman Wilfully Infringing Claim 6 Of* The '545 Patent*?*

Because the court concludes that Eastman's production of DHF at Longview does not infringe claim 6 of the '545 patent, the court concludes that Eastman is not wilfully infringing claim 6 of the '545 patent.

C. *Invalidity*

Eastman argues that claim 6 of the '545 patent is invalid on the grounds that Eastman's prior reductions to practice establish priority of invention pursuant to s. 102(g). Section 102(g) provides that a person is entitled to a patent unless

> before the application's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

35 U.S.C. s. 102(g). Eastman argues that the gas feed work of Monnier and Low, and Falling's experiments, constitute prior reductions to practice, and that the '208 application disclosed the results of their experiments. BASF argues that claim 6 of the '545 patent is not invalid because Monnier and Low's work does not meet the limitations of claim 6, and because Falling abandoned, suppressed, or concealed his experiments.

Claim 6 of the '545 patent is presumed to be valid. *See* 35 U.S.C. s. 282. Eastman bears the burden of proving invalidity by clear and convincing evidence. *See* Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 935 (Fed.Cir.), *cert. denied,* 498 U.S. 920 (1990). Clear and convincing evidence is shown when the trier of fact has "an abiding conviction that the truth of [the] factual contentions [is] highly probable." Colorado v. New Mexico, 467 U.S. 310, 316 (1984).

1. *Does The Work Of Eastman's Scientists Constitute Prior Reduction to Practice Of Claim 6?*

To show prior reduction to practice, Eastman must show that its work "meet[s] every element of the claimed invention" before August 8, 1989, the priority date of the '545 patent application. Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1378 (Fed.Cir.1986), *cert. denied,* 480 U.S. 947 (1987). *See also* UMC Electronics Co. v. United States, 816 F.2d 647, 651 (Fed.Cir.1987), *cert. denied,* 484 U.S. 1025 (1988) (stating that "there cannot be a reduction to practice of the invention here without a physical embodiment which includes all limitations of the claim").

This court has construed claim 6 to mean the catalytic rearrangement of EpB to DHF at temperatures between 60 (deg.) and 200 (deg.) C, using a catalyst system including a Lewis acid and an onium halide that is "substantially soluble in the reaction medium," where the reaction medium includes the EpB and the DHF alone. The court concluded that claim 6 precludes the addition of any solubilizer, but permits the addition of solvent. Additionally, the court concluded that, as long as the catalysis occurs in a liquid phase, claim 6 has no other phase-related requirements. Thus, in order to establish a prior reduction to practice, Eastman must show an experiment that meets all of these elements of claim 6.

In December 1987, Eastman scientists created an EpB team to develop a process for converting EpB to DHF. This team included Falling, Monnier, and Low. In June 1988. Falling began to experiment with different catalyst systems for catalytically rearranging EpB to DHF. Falling's experiments included EpB in liquid form, liquid-phase catalysis, and the production of liquid DHF.

Eastman asserts that two types of experiments performed by Falling constitute a prior reduction to practice. First, Falling conducted solubilizer-free experiments using a catalyst system of an onium halide and a Lewis acid, and optionally including a solvent. Second, Falling conducted neat experiments, solubilizer- and solvent-free, using a catalyst system of an onium halide and a Lewis acid.

On June 9, 1988, Falling mixed a Lewis acid, an onium halide, and a solvent with EpB at 100 (deg.) C. This produced 4.4% DHF. Falling used tetrabutylammonium iodide as the onium halide. At trial, both Falling and Eastman's chemical engineering expert, Dr. Bruce Gates, testified that this particular onium halide is substantially soluble in EpB and DHF, the reaction medium. Falling conducted similar experiments on June 15, and June 28, and June 30, 1988, switching the temperature in the first, switching the Lewis acid in the second, and switching the solvent in the third. On October 3, 1988. Falling catalytically rearranged EpB to DHF by mixing a Lewis acid (tributyltin iodide), an onium halide (tetrabutylphosphonium iodide), and a solvent (toluene), at 150 (deg.) C.

Falling also conducted three neat experiments, without any solubilizer or solvent. On July 6, 1988, Falling obtained 71.2% DHF when he mixed EpB with a Lewis acid (zinc iodide) and an onium halide (tetrabutylammonium iodide) at 66 (deg.) to 70 (deg.) C. In a memo written two days latter to the EpB team, Falling reported that this mix of zinc iodide and tetrabutylammonium iodide is the "best catalyst system studied thus far." On July 18, and July 27, 1988. Falling conducted two more neat experiments, both of which resulted in the production of trace amounts of DHF.

While Falling conducted his experiments, Monnier and Low were also experimenting with various catalyst combinations to convert EpB to DHF. In November 1988, Monnier and Low began to experiment with the onium halide, Lewis acid catalyst system that Falling found so successful to the catalytic rearrangement of EpB to DHF. Between November 1988 and January 1990, Monnier and Low ran numerous experiments converting EpB to DHF using a catalyst system of a Lewis acid and an onium halide at 110 (deg.) to 185 (deg.) C. All of these experiments were conducted without solvent or solubilizer.

Monnier's and Low's experiments were all gas feed. However, the court has construed claim 6 to mean that only the catalysis must occur in liquid phase. Both Monnier and Low testified at trial that the catalysis occurred in a liquid phase. Monnier stated that

[s]omewhere in this region after the tetraoctylammonium iodide has melted and formed a liquid phase, we have a situation were the EpB, which was added as a gas composition, actually dissolves into the liquid octyl ammonium iodide and now we have a classic situation of homogenous catalysis where the reaction is occurring between EpB in the liquid phase and [octyl] ammonium iodide which is liquid-phase film.

Accordingly, all of these experiments conducted by Falling, Monnier, and Low, resulted in the catalytic conversion of EpB to DHF using component A. an onium halide, where component A is substantially soluble in the reaction medium, and component C, a Lewis acid, at the relevant temperature range. Although some of these experiments included the addition of a solvent, none included solubilizer, component B. Falling's, Monnier's, and Low's experiments, with or without solvent, successfully converted EpB to DHF meeting all of the limitations of claim 6.

Accordingly, Eastman has shown by clear and convincing evidence that these experiments constitute prior reductions to practice of claim 6 of the '545 patent before August 8, 1989, and unless Eastman abandoned, suppressed or concealed the experiments, they establish priority of invention pursuant to s. 102(g).

2. *Did Eastman Abandon, Suppress, Or Conceal Its Experiments?*

BASF admits that Falling's neat experiments are within the scope of claim 6. However, BASF argues that Eastman abandoned, suppressed, or concealed, these experiments. Furthermore, as discussed above, BASF argues that Monnier's and Low's experiments are not within the scope of claim 6, and therefore, the question of abandonment, suppression, or concealment is not relevant to their work.

In order to show that Eastman did not abandon, suppress, or conceal experiments within the scope of claim 6, Eastman must show that it disclosed the process of claim 6 in a manner that would "bring the benefit of the knowledge of [the] invention" to the public, and that it did not unreasonably delay this disclosure. *See* Checkpoint Systems, Inc. v. United States Int'l Trade Comm'n, 54 F.3d 756, 761 (Fed.Cir.1995). *See also* National Presto Indus., Inc. v. Black & Decker (U.S.) Inc., Nos. 92-1388, -1476, 1995 WL 367072, at *6

(Fed. Cir. June 20, 1995) (stating that it "is necessary to consider the nature and extent of activity during the period between reduction to practice and the filing of the patent application"); Lutzker v. Plet, 843 F.2d 1364, 1366 (Fed.Cir.1988) (noting that an invention that is not publicly disclosed is deemed abandoned, suppressed, or concealed).

Eastman filed the '208 patent application on March 8, 1990. This application primarily disclosed the gas feed, liquid phase catalyst work done by Monnier and Low, which constitutes prior reductions to practice of claim 6. Accordingly, they did not abandon, suppress, or conceal their experiments. Even if the court concluded that Monnier's and Low's work was not a prior reduction to practice of claim 6, the evidence shows that Eastman did not abandon, suppress, or conceal Falling's experiments which constitute prior reductions to practice.

Falling, Monnier, and Low worked from the early summer 1988 to the beginning of 1990 to create a successful process for catalytically rearranging EpB to DHF. During this time, Falling conducted numerous experiments which constitute prior reductions to practice of claim 6. Falling's monthly reports documented the progress of these experiments. Over a year after Falling first began to experiment with different catalyst systems, he wrote in an August 1, 1989, memo to the EpB team, that "[t]he screening of catalyst systems for the homogenous rearrangement of EpB to 2,5-DHF is still in progress." Accordingly, it is clear that Eastman did not abandon Falling's experiments producing DHF from EpB. *See* Checkpoint 54 F.3d at 762 (finding that a four year delay between the time the inventor disclosed his invention to his employer, "further tested" and improved the invention, and worked towards commercializing it, "establish that [the inventor] was diligent in working toward commercializing" the security system, and did not constitute abandonment).

Although Eastman did not abandon Falling's experiments which establish prior reduction to practice, if Eastman suppressed or concealed them, they will not invalidate claim 6. Eastman filed the '208 application in March 1990, and the CIP in December 1990. BASF argues that neither the original application nor the CIP disclose Falling's work, and therefore, Eastman suppressed or concealed Falling's prior reductions to practice of claim 6.

Although the '208 application did not include any working examples of Falling's experiments, it generally covered Falling's work. The '208 application disclosed a process for the catalytic rearrangement of EpB to DHF using a catalyst system of an onium halide and a Lewis acid. In June 1988, Falling first discovered that mixing an onium halide and a Lewis acid would act as a successful catalyst. Monnier and Low began using this catalyst system in November 1988, after seeing the results Falling was obtaining with it.

The '208 application also discussed the optional use of an inert solvent, which Falling had experimented with. In particular, on page 14, lines 14 to 24, the '208 application states that the "organic onium iodide, optionally, in combination with a Lewis acid co-catalyst, may be used with an inert organic solvent if desired." It further refers to the "optional, inert organic solvent."

Furthermore, on page 3, lines 5 to 8 of the '208 application, it states that the process contemplated includes recovery of the DHF produced by various methods, including "decantation" and "filtration." Monnier testified at trial that both decantation and filtration mean the removal of a liquid-phase product. Falling's work was done entirely in liquid phase, whereas Monnier's and Low's work was gas feed of EpB and a gas product of DHF.

Eastman filed the CIP on December 14, 1990. The CIP was based on Falling's and Lopez-Maldonado's invention report. The CIP described the catalyst systems made up of onium halides and Lewis acids that Falling had worked on. Furthermore, the CIP added working examples of liquid phase experiments to the '208 application. Thus, the CIP clearly disclosed Falling's work on converting EpB to DHF.

The Federal Circuit has stated that "[w]hen determining whether an inventor has abandoned, suppressed, or concealed an invention, a period of delay between completion of the invention and subsequent public disclosure" is not always of legal significance. Checkpoint, 54 F.3d at 761. Falling last conducted a reduction to practice of claim 6 on October 3, 1988. Eastman filed the '208 patent application on March 8, 1990, approximately seventeen months later. Eastman filed the CIP on December 14, 1990, approximately twenty-six months later. The amount of time that elapsed between Falling's last reduction to practice and the filing of the '208 patent application, and even the CIP, does not demonstrate suppression or concealment. *See e.g.,* Cochran v. Kresock, 530 F.2d 385, 393 (C.C.P.A.1976) (in a case involving a delay of over 18 months, stating that "[m]ere delay, without more, is insufficient" to demonstrate abandonment, suppression, or concealment); Fisher and Speer v. Gardiner and Aymami, 215 U.S.P .Q. 620 (PTO Bd. of App.1981) (finding that a delay of 25 months between reduction to practice of the invention and filing the patent application did not constitute suppression or concealment).

In Englehardt v. Judd, 369 F.2d 408, 412 (C.C.P.A.1966), the United States Court of Customs and Patent Appeals stated that scientists should be given a reasonable amount of time to refine their invention. The *Englehardt* court stated that

[a] reasonable amount of time should be allowed for completion of the research project on the whole series of new compounds, a further reasonable period should then be allowed for drafting and filing the patent application(s) thereon, without subjecting the prior inventor or his assignee to the risk of forfeiture of valuable patent rights due to alleged concealment or suppression of the invention.

Id. The seventeen to twenty-six month period that elapsed between Falling's reduction to practice and the filing of the '208 application and the CIP constitutes a reasonable amount of time. Thus, the court concludes that Eastman did not suppress or conceal the work Falling did during the summer and fall of 1988.

The court concludes that Eastman did not abandon, suppress, or conceal the prior reductions to practice of claim 6 of the '545 patent, and therefore, claim 6 is invalid on the grounds of priority of invention pursuant to s. 102(g).

III. *CONCLUSION*

For the reasons stated above, the court concludes that Eastman is not infringing claim 6 of the '545 patent, claim 6 is invalid on the grounds of priority of invention pursuant to s. 102(g), and Eastman did not abandon, suppress, or conceal the invalidating prior reductions to practice. The court will enter an order in accordance with this memorandum opinion.

CERTIFICATE OF SERVICE

I, John W. Shaw, Esquire, hereby certify that on August 1, 1996, Elizabeth Gardner, Esquire of Kenyon & Kenyon, One Broadway, New York, New York 10004 caused copies of the foregoing document to be served by First Class Mail and fax upon the following:

William J. Marsden, Jr., Esquire

Potter Anderson & Corroon

350 Delaware Trust Building

Wilmington, DE 19801

Ralph A. Mittelberger, Esquire

Fish & Richardson

601 13th Street, N.W.

Washington, DC 20005

Frank P. Porcelli, Esquire

Fish & Richardson

225 Franklin Street

Boston, MA 02110-2804

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