

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF KANSAS

LAYNE CHRISTENSEN COMPANY and)
 DR. ARUP K. SENGUPTA)
)
 Plaintiffs,)
)
 v.)
)
 BRO-TECH CORPORATION,)
 d/b/a THE PUROLITE COMPANY,)
)
 Defendant.)
)
)
)

Case No. 09-2381-JWL

MEMORANDUM AND ORDER

Plaintiff Layne Chistensen Company asserts a claim against defendant Bro-Tech Corporation, d/b/a The Purolite Company for infringement of United States Patent No. 7,291,578 (“the Patent”), which describes an invention for the removal of arsenic and other contaminants from fluids.¹ The inventor, Arup K. SenGupta, who licensed the patented technology to plaintiff’s predecessor-in-interest, was added as a required party after the initiation of the lawsuit. Plaintiff and defendant disagree on how and whether various terms in the claims of the Patent should be construed, and the Court has considered the parties’ written submissions and the parties’ argument at a hearing conducted by the Court on July 5, 2011. The Court construes the various terms at issue

¹Plaintiff also asserts a state-law claim for breach of an agreement between defendant and plaintiff’s predecessor-in-interest. Defendant asserts counterclaims for a declaration of non-infringement and for breach of contract.

as set forth herein.

I. Claim Construction Standards

Claim construction is governed by the methodology set forth by the Federal Circuit Court of Appeals in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). It is a bedrock principle of patent law that the claims of the patent define the patentee's invention. *Id.* at 1312. Thus, claim construction begins with the words of the claim itself. *Id.* The words of a claim should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art in question at the time of the invention. *Id.* at 1312-13. "[T]he claims themselves provide substantial guidance as to the meaning of particular claim terms." *Id.* at 1314. Both "the context in which a term is used in the asserted claim" and the "[o]ther claims of the patent in question" are useful for understanding the ordinary meaning. *Id.*

The claims do not stand alone, but are part of "a fully integrated written instrument." *Id.* at 1315. Therefore, they "must be read in view of the specification, of which they are a part." *Id.* (quotation omitted). In fact, the specification is "the single best guide to the meaning of a disputed term" and is often dispositive. *Id.* The specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess, in which case the inventor's lexicography governs. *Id.* at 1316. In other cases, it may reveal an intentional disclaimer or disavowal of claim scope by the inventor; in that case, "the inventor has dictated the

correct claim scope, and the inventor’s invention, as expressed in the specification, is regarded as dispositive.” *Id.* The fact that the specification includes limited and specific embodiments is insufficient to define a term implicitly, and it is improper to confine the scope of the claims to the embodiments of the specification. *Id.* at 1323. “The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Id.* at 1316 (quotation omitted).

Moreover, the court must be careful not to import limitations from the specification into the claim. *Id.* at 1323. In walking the “fine line” between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim, the court must “focus . . . on understanding how a person of ordinary skill in the art would understand the claim terms.” *Id.* The purposes of the specification are to teach and enable those of skill in the art to make and use the invention and to provide a best mode for doing so. *Id.* Reading the specification in context should reveal whether the patentee is setting out specific examples of the invention to accomplish those goals, or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive. *Id.* Thus, the court’s task is to determine “whether a person of skill in the art would understand the embodiments to define the outer limits of the claim term or merely to be exemplary in nature.” *Id.*

The court should also consult the patent’s prosecution history, if in evidence. *Id.*

at 1317. Like the specification, the prosecution history “provides evidence of how the PTO [Patent and Trademark Office] and the inventor understood the patent.” *Id.* “Yet because the prosecution represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes.” *Id.*

Finally, the court may consult extrinsic evidence such as expert and inventor testimony, dictionaries, and learned treatises. *Id.* These have all been recognized as tools that can assist the court in determining the meaning of particular terminology. *Id.* at 1318. Extrinsic evidence may be helpful to the court in understanding the technology or educating itself about the invention. *Id.* In particular, because technical dictionaries collect accepted meanings for terms in various scientific and technical fields, they can be useful in claim construction by providing the court with a better understanding of the underlying technology and the way in which one skilled in the art might use the claim terms. *Id.* at 1318. “However, conclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court.” *Id.* Extrinsic evidence is less reliable than intrinsic evidence in determining the construction of claim terms, and therefore the court should discount any expert evidence that is at odds with the intrinsic evidence. *Id.*

II. Agreed Constructions

With respect to five terms of which defendant seeks construction, plaintiff argues

that no construction is necessary, although it has agreed with defendant on particular meanings for those five terms if construction is deemed necessary. Plaintiff argues generally that these terms are commonly understood by laypersons, but it has not attempted to explain why that is so with respect to any one of these five terms.

The Court agrees with defendant that these terms are technical and would *not* be easily or commonly understood by jurors, and that construction of these terms would be helpful to the jury. Accordingly, the Court construes these terms as agreed by the parties, as follows:

“Selective adsorbent” is construed to mean *an adsorbent that is preferentially adsorbent of some species compared to some other species.*

“Salt of a metal” is construed to mean *the compound formed when the hydrogen of an acid is replaced by a metal, such as a solution of a ferrous salt, such as ferrous sulphate, ferrous ammonium sulfate, ferrous chloride, or ferrous acetate.*

“Anionic oxidant” is construed to mean *any anionic oxidant compound, such as potassium permanganate.*

“A permanganate” is construed to mean *a salt containing the anion MnO_4^- , such as potassium permanganate.*

“Ligand” is construed to mean *substances, such as arsenates, chromates, oxalates, phosphates, phthalates, arsenite, monovalent arsenate, divalent arsenate,*

*arsenites, chromates, molybdates, selenites, and vanadate, including arsenic.*²

III. Disputed Constructions

Defendant has also proposed constructions for six other terms found in the claims of the Patent. Plaintiff again argues that no term needs construction. The Court concludes in each instance, however, that the particular term would not be commonly understood by the jury or that construction is necessary to resolve a dispute between the parties concerning the meaning of the term or the scope of the claims. *See O2 Micro Int'l v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) (“When the parties present a fundamental dispute regarding the scope of a claim term, it is the court’s duty to resolve it.”). Accordingly, the Court considers the constructions proposed by plaintiff in the alternative, and it construes these terms as follows.

A. “Adsorbent”

The parties dispute the proper construction of the term “adsorbent” in Claims 1 and 15 of the Patent. Claim 1 reads as follows:

- 1.** A method for synthesizing a selective adsorbent, the method comprising the steps of:
reacting a material that exhibits anion exchange behavior with an

²This agreed definition appears to be redundant, including “chromates” twice and both “arsenite” and “arsenites”, but the Court has adopted it as agreed by the parties. This construction can certainly be modified at a later time by agreement of the parties to correct any such problem.

anionic oxidant to produce an intermediate; and reacting, with said intermediate, a solution of a salt of a metal, said salt being capable of being oxidized, thereby precipitating and dispersing a salt of said metal throughout the intermediate by the action of the oxidant and producing an adsorbent capable of exchanging anions.

(Emphasis added.) Claim 15 reads as follows:

15. An adsorbent for the selective removal of ligands from fluids, said adsorbent comprising a polymeric anion exchange resin containing particles of an oxygen-containing compound of iron dispersed throughout the resin.

(Emphasis added.)

Defendant argues that “adsorbent” should be construed to mean the following: *a substance that has the ability to condense or hold molecules of other substances on its surface*. Defendant has taken that definition from a scientific dictionary. Plaintiff argues that the term should be construed to mean the following: *medium, including an anion exchange resin, for removal of contaminants from fluids*. Plaintiff’s proposed construction raises two issues.

First, plaintiff would include *an anion exchange resin* as an example in the construction of “adsorbent”. Plaintiff cites a portion of the Patent’s specification that notes that “[t]he adsorbent thus produced comprises a polymeric anion exchange resin.” Patent at 3:6-7. The Court concludes, however, the definition of “adsorbent” should not include the type of adsorbent produced here, as the remainder of Claim 1 more appropriately describes and limits the claimed adsorbent. Accordingly, the Court rejects plaintiff’s proposed inclusion of an example of an adsorbent.

Second, plaintiff's construction effectively defines adsorption merely as a method for removal of a substance, without explaining how the removal occurs (thus distinguishing adsorption from other methods of removal), as defendant's construction does (i.e., an adsorbent removes a substance by holding it on the surface of the adsorbent). The Court agrees with defendant that plaintiff's construction is therefore too over-inclusive. Plaintiff argued at the hearing that adsorption is technically more complex than as described by defendant's construction, but it conceded that adsorption does involve removal by holding the substance on the surface of the adsorbent. Plaintiff also conceded that an adsorption is not limited to the removal of contaminants or to the removal from fluids. For these reasons, the Court rejects plaintiff's construction as too broad.

Neither "adsorbent" nor "adsorption" is defined in the Patent; thus, it is reasonable to consult a scientific dictionary to define the term, as defendant has done. Nothing in the Patent suggests that "adsorbent" as used in the claims should have anything other than its ordinary meaning in the art. Moreover, plaintiff has conceded that defendant's definition is essentially accurate, and, as defendant points out, this same definition was cited by the applicant in the application process for the Patent. Accordingly, the Court adopts defendant's proposed construction, and the term "adsorbent" is construed to mean *a substance that has the ability to condense or hold molecules of other substances on its surface.*

B. “A Material That Exhibits Anion Exchange Behavior”

The parties dispute the proper construction of the term “a material that exhibits anion exchange behavior,” found in Claims 1, 2, 7, and 10 of the Patent. In independent Claim 1 (quoted above in Part III.A), this term is used to describe the starting material that is used in the first reaction set forth in that claim. Dependent Claims 2, 7, and 10 use the term in the same sense and refer back to Claim 1. Defendant argues that the term should be construed to mean the following: *a material with fixed positively charged functional groups and does not exhibit adsorbent behavior*. Plaintiff argues for the following construction: *a material having fixed positively charged functional groups, such as an anion exchange resin, including the Purolite A-500P anion exchange resin*.

As a starting point, the parties agree that the construction of this term should include the concept of having *fixed positively charged functional groups*, a construction supported by language in the Patent’s specification. *See* Patent at 2:24-25 (“anion exchangers have fixed positively charged functional groups”). The Court therefore adopts that agreed language for its construction of this term.

Plaintiff would add to this construction the example of *an anion exchange resin*, including referring by name to a particular product manufactured by defendant that is mentioned as a possible starting material in the Patent’s description of the invention’s preferred embodiments. The Court agrees with defendant, however, that it is inappropriate to include such examples in the definition of the term, and that naming defendant’s own product would unfairly prejudice defendant by injecting a fact question

(i.e., whether that product is in fact covered by the claim term) into the construction of a claim term. Plaintiff has cited no authority supporting the inclusion of such an example in the construction of a claim term; to the contrary, the caselaw stresses that a claim is not necessarily limited to the preferred embodiments described in the specification. *See Phillips*, 415 F.3d at 1323 (issue for construction is whether the embodiments define the outer limits of the claim or are merely exemplary). Therefore, the Court rejects plaintiff's proposed addition to the agreed-upon language for the construction of this term.

By its proposed construction, defendant would add the limitation that this starting material *not exhibit adsorbent behavior*. Defendant does not point to anything in the Patent's specification that supports such a limitation. Instead, defendant argues that this limitation is required as a matter of logic, based on the language of Claim 1. Defendant notes that the starting material for the reactions in Claim 1 is "a material that exhibits anion exchange behavior" (the term being construed here) and that the result after the reactions is "an adsorbent capable of exchanging anions." Defendant equates "capable of exchanging anions" with "exhibit[ing] anion exchange behavior;" thus, according to defendant the only difference between the starting and ending material, as stated in the claim, is that the ending material is an adsorbent. Defendant therefore argues that the starting material cannot be an adsorbent, because otherwise the starting and ending materials would be the same, and the method claimed in Claim 1 would be pointless.

The Court rejects this argument by defendant. Claim 1 sets forth two reactions

that must take place; thus, by the terms of the claim, the starting material is not identical to the ending material. The fact that the claim does not also describe physically how the starting and ending materials are different does not necessarily mean that the two materials must have remained identical, as defendant would seem to argue, and defendant has not cited any authority that would require a claim to include such a description. It is also significant that in the preferred embodiment, as defendant concedes, the starting material is in fact an adsorbent material. Defendant correctly points out that it is possible for a claim to be properly construed to exclude the preferred embodiment; but in this case, there is no basis to construe the claim to do so. Therefore, the Court rejects the additional limitation proposed by defendant.

Accordingly, the Court construes the term “a material that exhibits anion exchange behavior” to mean *a material that has fixed positively charged functional groups*.

C. “Dispersing” / “Dispersed”

The parties next dispute the proper construction of the term “dispersing”, found in Claim 1 of the Patent, and the term “dispersed”, found in Claims 11 and 15. Claim 1 describes a step that involves “dispersing a salt of said metal throughout the intermediate.” Dependent Claim 11 refers to the “dispersed salt of said metal.” Independent Claim 15 refers to “particles of an oxygen-containing compound of iron dispersed throughout the resin.” Defendant argues that the verb “dispersing” in Claim

1 should be construed to mean *distributing particles through another system*. Plaintiff argues that “dispersing” should mean *loading, embedding, or encapsulating*. Each party would then construe the adjective “dispersed” in a manner consistent with its definition of “dispersing”.

Defendant cites various dictionaries to support its construction. Those and other dictionaries generally define “dispersing” to mean distributing or spreading. Defendant would also add *through another system* to the definition, although defendant’s dictionaries refer to distribution “throughout” or “in” another substance. Claims 1 and 15, however, provide the relevant preposition, requiring dispersion “throughout” the intermediate or resin. Thus, the Court will not include a prepositional phrase in its construction of “dispersing”, as the Court construes “throughout the intermediate” and “throughout the resin” elsewhere in this opinion.

Plaintiff offers *loading, embedding, and encapsulating* as synonyms of “dispersing”, based on the specification’s use of those terms in describing the invention’s process. The specification does not make clear, however, that those terms are indeed identical in meaning to “dispersing”; in fact, those words could describe various ways to achieve the claimed dispersion. Moreover, the words offered by plaintiff are more technical and less likely to be easily understood by the jury than the term being construed. Plaintiff has not shown that “dispersing” and “dispersed” are used in the Patent’s claims other than in their ordinary meaning. Therefore, the Court will construe these terms to have their ordinary meaning, as set forth in the various dictionaries.

Accordingly, the Court construes “dispersing” in the claims to mean *distributing or spreading*. The Court construes “dispersed”, used as an adjective in the claims, to mean *distributed or spread*.

D. “Throughout the Intermediate” / “Throughout the Resin”

As noted above, Claim 1 describes a step that involves “dispersing a salt of said metal throughout the intermediate,” while Claim 15 refers to “particles of an oxygen-containing compound of iron dispersed throughout the resin.” Defendant would construe these two quoted terms by simply replacing the word “throughout” with the words *in every part of*. Plaintiff would construe this term from Claim 1 to mean *loading, embedding, or encapsulating a salt of the metal within the intermediate*; and would construe the term from Claim 15 to mean *particles of an oxygen-containing compound of iron, such as hydrated iron oxide, loaded embedded, or encapsulated within the resin*.

First, plaintiff’s proposed constructions incorporate its proposed constructions for “dispersing” and “dispersed”. The Court has already construed those words otherwise. *See supra* Part III.C.

Second, in Claim 15, plaintiff proposes including the example of *hydrated iron oxide*. Just as it did for other terms construed above, the Court concludes that including a mere example in the construction would be inappropriate, and it therefore rejects this portion of plaintiff’s proposed construction.

Thus, the Court is left to construe the term “throughout” in these claims, for

which defendant would substitute *in every part of*, and for which plaintiff would substitute the word *within*. The parties' dispute goes beyond that semantic disagreement, however. Plaintiff appears to take the position that the terms "throughout the intermediate" and "throughout the resin" would encompass a situation in which only one or two particles enter the interior, or go beyond the periphery, of the intermediate or resin (i.e., *within* the intermediate or resin). On the other hand, defendant argues that these terms (along with other terms construed below) require that the particles (the salt of the metal) be distributed to every possible exchange site in every bead of the intermediate or resin (i.e., *in every part* of the intermediate or resin), thereby achieving saturation with a stoichiometric amount of the salt (i.e., enough to cover all of the possible exchange sites).

The Court begins with the ordinary meaning of the word "throughout". Dictionaries generally agree that the word, used as a preposition as it is here, means all the way through, or through the whole of, or in or to every part of, or everywhere in. Defendant's proposed use of *in every part of* is therefore consistent with the ordinary meaning of "throughout". *Within*, however, which plaintiff proposes, has a different meaning—that word is generally understood to mean inside of, or contained in.

Plaintiff has not shown that "throughout", as used in the claims, should mean *within* or have some other meaning different from the ordinary meaning of the word. For instance, plaintiff cites to various places where the Patent's specification refers to "dispers[ion] . . . within" a substance, but the specification does not suggest in any place

that “dispersion within” means the same as “dispersion throughout.” In this case, it is indeed significant that the claims do not refer to “dispersion within,” as the “throughout” language was added to Claim 15 after a rejection by the examiner, specifically to overcome anticipation by prior art (the Salem patent).

Plaintiff argues that this prosecution history—adding the “throughout” language to overcome Salem—supports its use of *within* to construe “throughout”. Claim 15 originally referred to “a polymeric anion exchange resin containing dispersed particles of an oxygen-containing compound of iron.” The only evidence submitted concerning the examiner’s rejection of that claim is the following statement by the examiner:

Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Salem. USP 5397477 to Salem states:

The effluent stream from Mixed Bed D contains a concentration in the range of about 10 ppb by weight of metal oxide particulate at 5 service days, increasing to almost 40 ppb at 30 service days. This increase is postulated to demonstrate that, at least initially, the mixed bed containing conventional cation exchange resin and the conventional anion exchange resin are expected to adsorb iron oxide particles. However, the metal oxide particulate concentration of the Mixed Bed D effluent stream is expected to increase significantly over time. This hypothetical increase is consistent with a well-known tendency of conventional mixed beds to become saturated with an equilibrium loading of adsorbed metal oxide particulate on the surface of the resin particles. Generally speaking, after the surface loading equilibrium is achieved, very little additional metal oxide particulate removal takes place and the ion exchange resins of such saturated conventional beds are usually relegated to disposal.

Accordingly, Salem teaches that anion exchange resins containing dispersed particles of iron oxide were known.

After this rejection of Claim 15, a summary of an interview between the examiner and

a representative for the applicant states as follows:

Per claim 15, Applicant argued Salem does not describe a polymeric anion exchange resin containing “dispersed particles of an oxygen-containing compound of iron.” This argument alone was not persuasive, but the examiner acknowledged that Salem does not describe particles of iron dispersed “throughout” the adsorbent. The examiner proposed changing “dispersed particles . . . of iron” to read “particles . . . of iron dispersed [*sic*] throughout the resin.” With this change, the examiner agreed to withdraw the rejection of claim 15 over Salem.

In subsequently allowing Claim 15 as revised in accordance with the examiner’s suggestion, the examiner stated that “Salem does not describe dispersing a salt of a metal ‘throughout’ the adsorbent.”

Plaintiff points to the language from Salem, quoted by the examiner in his rejection, relating to saturation on the surface of the resin particles. Based on that language, plaintiff argues that penetration beyond the surface was required to distinguish and overcome Salem, and that the “throughout” phrase was therefore added to Claim 15 to indicate that the claim required only the dispersion of the salt within, or beyond the surface of, the resin. As defendant points out, however, the portion of Salem quoted by the examiner does suggest that some metal oxide particulate—in however small an amount—can penetrate the surface to the interior of the resin. The only conclusions that may reasonably be drawn from the comments of the examiner is that because “resins containing dispersed particles . . . were known,” Claim 15 had to go beyond a resin that contains dispersed particles to overcome Salem, and that adding “throughout the resin” to refer to the dispersion solves the problem. Reading more into the examiner’s

statements would require pure speculation. This history does not suggest in any way that “throughout” was intended to have anything other than its ordinary meaning.³

Plaintiff has not submitted any other evidence supporting its construction of “throughout”. Accordingly, the Court rejects plaintiff’s proposed construction, including its argument that the term encompasses penetration into the interior by only one or two particles, in favor of construing “throughout” consistent with its ordinary meaning (i.e., through the whole of, in every part of).

The Court next turns to defendant’s larger argument that the Patent’s claims require that a stoichiometric amount of metal compound be used, so that every possible exchange site within each bead of the intermediate or resin is reached, and the intermediate or resin has thus become fully saturated. Defendant seeks to add that limitation to the claims by way of its proposed construction of “throughout” and the other claim terms discussed below, *see infra* Parts III.E, III.F. With respect to this term specifically, defendant appears prepared to argue at trial that dispersion “in every part of” the intermediate or resin means reaching every exchange site within every resin bead. The Court rejects this larger argument, as it concludes that the evidence does not support importing such a significant limitation into the claims.

Defendant cites to two places where the Patent’s specification refers to “uniform”

³This conclusion also takes care of plaintiff’s argument, made at the hearing, that the term “dispersed” is sufficient to account for any type of quantitative requirement, as the examiner clearly decided that something beyond mere dispersion was required for allowance of Claim 15.

dispersion and a “uniform” color achieved when the process is complete. Uniformity does not necessarily mean full saturation, however, and those descriptions refer only to preferred embodiments at any rate. Defendant also argues that the actual amounts cited in the specification’s examples show that a stoichiometric amount was used. The Court cannot make that conclusion from the face of the Patent, however, and defendant has provided no evidence from one skilled in the art to support that argument. Furthermore, the use of a stoichiometric amount in the preferred embodiments would not mean that the claims required the same. Therefore, the Court does not find the specification to be helpful on this question, as it does not show that the claims (as opposed to some embodiments) require a stoichiometric amount.

Defendant also attempts to rely on the prosecution history relating to Salem. In particular, defendant cites testimony by Dr. SenGupta concerning his understanding of the Salem patent. That testimony is not especially helpful, as Dr. SenGupta did not provide any evidence of the examiner’s reasoning in rejecting the original Claim 15 (in fact, Dr. SenGupta testified that he disagreed with the examiner’s decision). Moreover, in distinguishing Salem from his own invention, Dr. SenGupta opined that Salem did not describe a method placing a “significant amount” of particles inside the exchanger going all the way to the interior. At most, that testimony suggests that his own invention is a method for dispersing a “significant amount” within the resin—thus, the testimony falls short of requiring a stoichiometric amount or full saturation. Dr. SenGupta’s testimony that the capacity of the Purolite A-500P resin used in the specification is publicly

available is similarly unhelpful, as such testimony does not bear on whether the Patent's *claims* require a certain capacity.⁴

The other extrinsic evidence cited by defendant also fails to support the proposed limitation. For instance, Dr. SenGupta's use of "evenly" and his reference to substantial uniformity in another patent application does not suggest that "throughout" means the use of a stoichiometric amount. Similarly, the fact that employees of plaintiff's predecessor-in-interest (to whom Dr. SenGupta licensed the technology) used 105% of the stoichiometric amount in one example in a patent application does not mean that dispersion "throughout" required a stoichiometric amount in all cases in that patent (let alone the present Patent). Finally, defendant notes that its license and manufacturing agreement with plaintiff's predecessor required use of "sufficient permanganate to saturate all of the available anion exchange sites on the resin." Again, however, the fact that one example of the technology uses a stoichiometric amount does not mean that the language of the claims requires that amount and is not broader.

In summary, defendant has not provided evidence, intrinsic or extrinsic, that clearly supports adding this limitation that has no foundation in the language of the

⁴At the hearing, both parties cited to certain pages of Dr. SenGupta's deposition in addressing this question of whether a stoichiometric amount is required. Because the parties failed to submit those pages of the deposition to the Court, however, the Court has not considered any such testimony.

claims themselves.⁵ With respect to the specific term “throughout”, even if the term is construed to mean *in every part of*, as defendant proposes, that construction does not necessarily require reaching every exchange site within every bead of resin, as “part” might reasonably and ordinarily refer to an area broader than a single exchange site. In that sense, it is significant that the claims do not require dispersion “throughout” each resin *bead*, but merely require dispersion “throughout the intermediate” or “throughout the resin.” Thus, the mere use of “throughout” here, in its ordinary sense, does not require the use of a stoichiometric amount, as defendant proposes, and the Court therefore rejects any such limitation in construing the terms of the claims.

For these reasons, the Court will construe “throughout” consistent with its ordinary, dictionary definition, while also foreclosing the parties’ broader arguments concerning the scope of the Patent’s claims that are inconsistent with that definition and do not find support in the Patent or elsewhere. *See O2 Micro Int’l*, 521 F.3d at 1360-62 (in construing patent terms, the court must resolve legal issues regarding the scope of the claims, as the jury cannot be allowed to consider arguments concerning such issues).

Accordingly, the Court construes the term “throughout” as follows: *Dispersion “throughout the intermediate” and “throughout the resin” in Claims 1 and 15 respectively means all the way through the intermediate or resin, or through the whole*

⁵In light of this conclusion, the Court need not address plaintiff’s argument, based on the doctrine of claim differentiation, that defendant’s interpretation of Claim 1 would render dependent Claim 6 superfluous.

of it, or in or to every part of it, or everywhere in it. Dispersion “throughout” the intermediate or resin is not achieved merely by having some particles reach the interior or go beyond the periphery of the intermediate or resin. On the other hand, dispersion “throughout” the intermediate or resin does not require that a stoichiometric amount was used or that every possible exchange site was reached.

E. “Intermediate”

The parties dispute the proper construction of term “intermediate”, which is found in Claims 1, 2, and 5 of the Patent. Defendant has proposed the following construction: *the material that exhibits anion exchange behavior that is reacted with the anionic oxidant. The reaction that creates the “intermediate” occurs by reacting at least a stoichiometric equivalent amount of anionic oxidant to anion exchange sites in the material that exhibits anion exchange behavior.* Plaintiff argues that the terms should be construed to mean *the substance formed as the result of a reaction between a material that exhibits anion exchange behavior and an anionic oxidant.*

Each party defines this term by simply referring to the reaction, as described in Claim 1, that produces the “intermediate” referenced in Claims 1, 2, and 5. Defendant would also add the limitation that the reaction involves a stoichiometric amount of the oxidant. For the reasons set forth above with respect to the construction of “throughout”, *see supra* Part III.D, the Court rejects the defendant’s proposed limitation.

The Court also disagrees with the parties’ method of defining this term by

reference to the reaction that produces it. The language of Claim 1 adequately defines the reaction that must take place; thus, defining “intermediate” to include that reaction is unnecessary. The Court further believes that defining the word “intermediate”, which may not be readily understood by a layperson, is appropriate. In the words of one dictionary, the word “intermediate” in this context simply means a substance “formed as an intermediate step between the starting material and the final product.” *See Webster’s Third New Int’l Dictionary* at 1180 (1993). The parties do not dispute that the word is used in that way in these claims.

Accordingly, the Court construes “intermediate” to mean *a substance formed as an intermediate step between the starting material and the final product.*

F. “A Polymeric Anion Exchange Resin”

Finally, the parties dispute the proper construction of the term “a polymeric anion exchange resin,” found in Claims 7 and 15 of the Patent. Defendant argues that the term means *all of the polymeric beads that exhibit anion exchange behavior*. Plaintiff argues that the term means *a polymeric material that exhibits anion exchange behavior, such as the Purolite A-500P anion exchange resin.*

Thus, the parties seem to agree that the term means *a polymeric material that exhibits anion exchange behavior.*⁶ Plaintiff would also add the example of *the Purolite*

⁶Although the word “polymeric” would not seem to be a term readily understood
(continued...)

A-500P anion exchange resin, but the Court again concludes that the inclusion of an example—especially one naming a specific product—is not appropriate here.

Defendant’s addition would essentially define “a polymeric resin” to mean *all of the polymeric beads* in the resin. Defendant characterizes this dispute as concerning the proper construction of the word “resin” (although neither party has offered a definition of “resin”), and defendant apparently seeks to foreclose a later argument by plaintiff that the term “resin” here can refer to a single resin bead.

Plaintiff has joined this battle, arguing that the Patent’s specification supports the argument that “resin” can refer to a single bead, but those citations are unavailing. Plaintiff first cites the following language from the specification’s summary of the invention:

The material that exhibits anion exchange behavior is preferably a polymeric anion exchange resin, and may comprise weak base organic ion exchange beads containing primary, secondary or tertiary amine groups or a mixture thereof.

Patent at 2:61-65. Plaintiff argues that this language indicates that the resin *may* comprise “beads” (plural) and thus also may comprise only a single bead. The Court agrees with defendant, however, that the use of “may” more reasonably indicates not that a single bead may also be used, but that other types of beads (plural) may also be used.

⁶(...continued)

by a layperson, the parties agree that that requirement is not at issue in the case and that the word therefore need not be defined. Accordingly, the Court declines to provide a definition of the word.

Plaintiff also notes that Figure 3 in the Patent shows only a single bead while the description of that figure refers to “resin” and not to a resin bead. *See* Patent at 3:59-61. The description does not state that the figure shows resin, however, but states only that the diagram illustrates why a certain resin does not have a particular trait. Thus, this reference does not support plaintiff’s argument. Finally, plaintiff cites the specification’s list of alternative substances that may be used instead of a certain type of resin, which list includes references to certain types of “resin beads” as well as fibrous materials. *See* Patent at 9:66-10:12. Plaintiff argues that because fiber may be used, “resin” need not comprise multiple beads. Fiber, however, is listed as a non-resin alternative, and the cited excerpt does not support a construction of “resin” as possibly comprising only a single bead.

Thus, the Patent itself does not support plaintiff’s argument. Nor has plaintiff offered any additional evidence on the meaning of “resin” or that supports its construction of the scope of the claims in this regard.

In fact, all of the relevant evidence suggests that “resin” is understood to refer to a collection of multiple beads. The specification refers to “beds” of resin, which implies a relatively large volume of resin that must consist of more than one of the microscopic beads. *See, e.g.*, Patent at 3:15-25, 4:66-5:1. The specification also refers to “resin beads,” which suggests that resin is a collection of multiple beads. *See, e.g., id.* at 6:58-64, 9:66-10:12. Most significantly, the specification includes the following statement:

Anion exchange resins from other manufacturers may of course be

used. Particles sizes of the anion exchange resins are preferably in the range from 300 μm [micrometers, i.e., millionths of a meter] to 1000 μm .

Id. at 5:13-15. This language also indicates that resins are comprised of multiple microscopic particles or beads. Defendant also notes that two examples of prior art cited in the Patent refer to beds of resin made of beads. *See Arthur A. Collins, Inc. v. Northern Telecom Ltd.*, 216 F.3d 1042, 1044-45 (Fed. Cir. 2000) (prior art may assist in ascertaining the meaning of a term to one skilled in the art).⁷ In addition, the only expert evidence offered by the parties consists of a declaration submitted by defendant, in which a resin expert states that to one skilled in the art, “resin” as used in these claims refers to many resin beads.⁸

Therefore, the Court agrees with defendant that “resin” here refers to a substance

⁷Defendant notes that in response to a request for admission, plaintiff denied that “[t]he adsorbent of claim 15 is a single (i.e., one) anion exchange resin bead.” Plaintiff could have denied that request, however, on the basis that the adsorbent is not *necessarily* a single bead, which would not foreclose the possibility that the adsorbent *could be* a single bead (as plaintiff argues here). Whether or not plaintiff should have explained its denial further, *see* Fed. R. Civ. P. 36(a)(4) (denial must fairly respond to the substance of the matter), the Court does not agree that plaintiff is somehow estopped from taking the position it has here.

⁸Plaintiff objects to defendant’s submission of this expert declaration. The Court agrees that defendant violated the Court’s scheduling order by failing to disclose this expert before submitting his declaration. Plaintiff has not shown any prejudice from that violation, however, as plaintiff did not subsequently seek leave to depose the expert or to supplement its own submission with evidence from an expert. Nor did plaintiff dispute the expert’s opinion on this issue at the hearing. Thus, the Court has considered the declaration. The Court notes, however, that even if the declaration were excluded, the Court would construe this term in the same way, based on the other evidence cited above.

containing multiple beads, and it rejects plaintiff's argument that the scope of the claims allows for "resin" to refer to a single bead. Thus, the Court resolves the parties' dispute concerning the meaning of "resin", as characterized by defendant. That decision, however, does not appear to resolve the propriety of the construction proposed by defendant, who would construe "a polymeric resin" to mean "all of the polymeric beads" that exhibit the particular behavior. Defendant's purpose in proposing this construction is unclear. If defendant intended merely to counter plaintiff's single-bead argument, its proposed construction is unnecessary, as the Court can simply note that "resin" refers to a substance comprised of multiple beads. If defendant intended by this construction to further its proposed limitation that the dispersion must involve a stoichiometric amount reaching every exchange site, that construction is rejected for the same reasons set forth above in the discussion of "throughout". *See supra* Part III.D. Defendant has not shown that "a resin" as used within this term necessarily means to *all of the beads*, and the Court sees no reason to include such language in its construction.⁹

⁹In a summary of argument submitted to the Court at the hearing, defendant argues that if "resin" could mean something less than all of the beads, one could not determine how many beads are required for infringement, thereby rendering the claim indefinite. Defendant has not explained, however, how the claims' references to "resin" generally are fatally indefinite, or how this issue of the quantity of affected beads relates to a dispute between the parties regarding claim scope, other than with respect to requirement of a stoichiometric amount, addressed above. With respect to this latter dispute, the term "throughout" defines the scope of the claim, and defendant has not provided any argument why that term is fatally indefinite. Thus, the Court rejects any argument that its constructions should be affected by a consideration of a possibility of indefiniteness.

Accordingly, the Court construes the term “a polymeric anion exchange resin” to mean *a polymeric material comprising multiple beads that exhibits anion exchange behavior.*

IT IS THEREFORE ORDERED BY THE COURT THAT certain terms in the patent at issue in this action are construed as set forth herein.

IT IS SO ORDERED.

Dated this 22nd day of July, 2011, in Kansas City, Kansas.

s/ John W. Lungstrum
John W. Lungstrum
United States District Judge