

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

NNCRYSTAL US CORPORATION and  
THE BOARD OF TRUSTEES OF THE  
UNIVERSITY OF ARKANSAS,

Plaintiffs,

v.

NANOSYS, INC.,

Defendant.

Civil Action No. 19-1307-RGA

MEMORANDUM ORDER

Before me is the issue of claim construction for the term, “non-coordinating solvent,” as used in Claim 1 of the ’051 Patent. I held a claim construction hearing on April 7, 2022. (D.I. 126). After the hearing, I requested supplemental briefing from the parties on the narrow issue of whether, as of the priority date, a POSA would have understood that the “non-coordinating solvent” referred to in the ’051 Patent is a solvent that does not coordinate to any reactive precursors. (D.I. 128). I have considered the parties’ joint and supplemental briefing. (D.I. 99, 143, 149, 158).

Both parties have agreed to the inclusion of Plaintiffs’ proposed limitation, “does not coordinate to the surface of the growing nanocrystal,” as part of the construction of the term, “non-coordinating solvent.” (D.I. 143 at 3 n.1). The remaining point of dispute is whether the construction should also include the limitation, “does not coordinate to the reactive precursors.” After considering the specification, prosecution history, and extrinsic evidence submitted by the parties, I find that it should.

During IPR proceedings for the '051 Patent, Plaintiffs and their expert, Dr. Vela, made several statements suggesting a non-coordinating solvent is one that not only does not coordinate to the surface of the nanocrystal, but also does not coordinate to the reactive precursors. Dr. Vela explained in his IPR declaration, “The distinction between a solvent and a ligand became important in the '051 patent, as the solvent no longer coordinated to precursors or nanocrystals. In the '051 patent, the solvent is the non-coordinating reaction medium, while the ligands form complexes with cation precursors and stabilize nanocrystals in solution.” (D.I. 65-3 ¶ 46). Dr. Vela contrasted these properties of a reaction taking place in a non-coordinating solvent against those of a reaction taking place in a coordinating solvent, where the “coordinating solvent system . . . serve[s] as the reaction medium and coordinate[s] to precursors and/or nanocrystals, e.g., serving as both a solvent and a ligand.” (*Id.* ¶ 45). Consistent with Dr. Vela’s statements, Plaintiffs included a diagram in one of their IPR submissions to illustrate how TOP and TOPO, unlike non-coordinating solvents, “function as coordinating solvents to dissolve nanocrystal precursors,” including both cation and anion precursors, before “coordinat[ing] at the surface of a nanocrystal, functioning as a ligand.” (D.I. 65-4 at 9).

In his IPR deposition, Dr. Vela testified, “In the context of [the '051 Patent], I don’t see any conditions where the non-coordinating solvent is binding to anything, really.” (D.I. 65-5 at 5:23-6:1). He then confirmed, “I think you could say that,” after being asked, “So if there’s any binding between a given solvent and the reactants, it cannot be considered a non-coordinating solvent in the context of the '051 patent?” (*Id.* At 6:2-6).

Without deciding whether Plaintiffs’ IPR statements are sufficiently “clear and unmistakable” to constitute prosecution disclaimer, I find that they are at least relevant to the

construction of the term, “non-coordinating solvent.” *Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1361 (Fed. Cir. 2017) (“Because an IPR proceeding involves reexamination of an earlier administrative grant of a patent, it follows that statements made by a patent owner during an IPR proceeding can be considered during claim construction and relied upon to support a finding of prosecution disclaimer.”). They serve as persuasive evidence that a POSA would have understood that the term, “non-coordinating solvent” as used in the ’051 Patent precludes coordination to the reactive precursors in addition to coordination to the surface of the nanocrystal.

In his declaration in support of Plaintiffs’ current proposed construction, Dr. Vela again confirms, “Generally, non-coordinating solvents do not coordinate either to the surface of the growing nanocrystals (as proposed by Plaintiffs), or to the cation and anion precursors (as proposed by Defendant).” (D.I. 100-1 Ex. 1 ¶ 81). He goes on to opine that a POSA “would recognize that it is a non-coordinating solvent’s lack of coordination to the growing nanocrystal’s surface, not the reactive precursors, that is pertinent to the invention.” (*Id.*) He does not, however, offer a persuasive explanation for why the pertinence of the non-coordinating solvent’s lack of coordination to the nanocrystal’s surface would preclude a POSA from also understanding the non-coordinating solvent in the invention does not coordinate to the reactive precursors, in accordance with the “general” definition of a non-coordinating solvent.

I am not persuaded by Dr. Vela’s testimony that the ’051 Patent’s description of possible interaction between the non-coordinating solvent and elemental sulfur, an anion precursor, “shows that it is the interaction of the solvent at the surface of the nanocrystal,” alone, “that determines whether it is coordinating or noncoordinating.” (*Id.* ¶ 83 (citing ’051 Patent at 9:36-39)). Plaintiffs

have not presented any expert testimony to refute what both parties made clear at oral argument: interaction and coordination are not the same. (D.I. 126 at 8:2-17, 50:5-51:20).

Construing the term “non-coordinating solvent” to preclude coordination with any reactive precursors is also consistent with the ’051 Patent’s specification. The specification explains, “The use of non-coordinating solvent systems presents significant design advantages in the preparation of nanocrystals, because these solvents allow the reactivity of precursor monomers to be tuned by simply varying the ligand concentration in solution.” (’051 Patent at 5:43-47). The specification emphasizes that this ability to tune the reaction using ligands “is a parameter which does not exist in a synthesis performed in coordinating solvents,” implying that a non-coordinating solvent, by contrast, does not coordinate to either the nanocrystal or the precursor monomers. (*Id.* at 11:5-7).

Finally, I credit the deposition testimony of Dr. Peng, the first named inventor on the ’051 Patent, as further confirming that a POSA would have understood that the non-coordinating solvent of the ’051 patent does not coordinate to the reactive precursors. Dr. Peng testified, “By definition non-coordinating solvents don’t coordinate or don’t form [] coordination bonds with either [the] cation or anion to form stable complexes.” (D.I. 149-2 at 36:16-19)

For these reasons, I find that a POSA would have understood the term, “non-coordinating solvent,” as used in the ’051 patent to preclude coordination to the reactive precursors. Plaintiffs have not identified any convincing evidence – intrinsic or extrinsic – to rebut this construction or show that the ’051 Patent discloses any coordination to any of the reactive precursors by the non-coordinating solvent. Therefore, I adopt the following construction for the term, “non-coordinating solvent”: “a solvent that does not coordinate to the surface of the growing nanocrystal or to the reactive precursors.”

The parties should submit an appropriate order for this term and the terms I construed during oral argument within five days.

IT IS SO ORDERED.

Entered this 3rd day of June, 2022.

/s/ Richard G. Andrews  
United States District Judge