

UNITED STATES. PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SYMRISE AG and SYMRISE INC.,

Petitioner,

v.

INOLEX INVESTMENT CORPORATION,

Patent Owner.

IPR2023-01035
Patent 10,995,048 B2

Record of Oral Hearing
Held: September 19, 2024

Before ULRIKE W. JENKS, TINA E. HULSE, and
ROBERT A. POLLOCK, *Administrative Patent Judges*.

IPR2023-01035
Patent 10,995,048 B2

APPEARANCES:

ON BEHALF OF THE PETITIONER:

RYAN MURPHY, ESQUIRE
Polsinelli PC
1401 I St. N.W.
Suite 800
Washington, D.C. 20005

ON BEHALF OF THE PATENT OWNER:

AARON LUKAS, ESQUIRE
WILLIAM BLAKE COBLENTZ, ESQUIRE
MICHAEL FEVOLA, ESQUIRE
Cozen O'Connor
1200 19th Street, N.W.
Washington, DC 20036

The above-entitled matter came on for hearing on Thursday,
September 19, 2024, commencing at 1:00 p.m., via videoconference.

P R O C E E D I N G S

1 - - - - -

2 JUDGE HULSE: Hello, everyone. This is the final hearing in IPR
3 2023-01035 involving U.S. Patent 10,995,048. Petitioner is Symrise AG
4 and Patent Owner is Inolex Investment Corporation. I'm Judge Hulse. I'm
5 joined by Judge Jenks and Judge Pollock. I'd like to start with appearances,
6 please. Beginning with Petitioner, would you please introduce yourself and
7 whoever is with you, either in person or virtually?

8 MR. MURPHY: Yeah. Ryan Murphy for Petitioner, and my
9 colleague James Murphy is also on the line.

10 JUDGE HULSE: Thank you. Patent Owner, could you please
11 introduce yourself and whoever is with you?

12 MR. LUKAS: Yes, Your Honor. Aaron Lukas of Cozen O'Connor,
13 on behalf of Inolex Investment Corp. With me today is Blake Coblentz, also
14 from Cozen O'Connor, and I believe Michael Fevola, who is with Inolex, is
15 also on the line.

16 JUDGE HULSE: Welcome, everyone. Thank you all for being here.
17 We are here today to address Patent Owner's non-contingent revised motion
18 to amend and its proposed substitute claims 29 to 44. We reviewed the
19 briefs and the evidence, which we have available to us on our computers
20 along with your demonstratives. So, you're welcome to point us to anything
21 in the record, and we can pull that up as needed. We have received
22 Petitioner's objections to Patent Owner's reply and Patent Owner's response
23 to those objections, and we'll take those under advisement and address those
24 objections in the final written decision, if needed.

1 Please note that this proceeding is being streamed online to the public
2 to enable public attendance. So, just a reminder to everyone online that
3 recording of any PTAB hearing is prohibited. The court reporter will
4 provide a transcript of the hearing that the Board will enter into the record as
5 soon as it becomes available. To ensure that the transcript of the hearing is
6 clear, please speak clearly and identify specific slide numbers when referring
7 to your demonstratives, and please mute yourself when not speaking. If you
8 encounter any technical difficulties, please let us know immediately.

9 As stated in the hearing order, each party has 60 minutes of total time
10 to argue their case. Petitioner will open the argument and may reserve no
11 more than 30 minutes of rebuttal time. Patent Owner will then respond to
12 Petitioner's arguments and may also reserve no more than 30 minutes of sur-
13 rebuttal time. I'll be timing you and will give you a five-minute warning, but
14 I encourage you to keep track of time yourself as well.

15 Does anyone have any questions? Hearing none. Let's start with
16 Petitioner. Would you like to reserve any rebuttal time?

17 MR. MURPHY: Yes, Your Honor, I'd like to reserve 20 minutes,
18 please, for rebuttal.

19 JUDGE HULSE: Okay. Very good. You may begin your arguments
20 when you're ready.

21 MR. MURPHY: May it please the Board. Ryan Murphy,
22 representing Symrise AG. And as you mentioned, we're here to discuss
23 IPR2023-01035. And we were going to start with an overview of the issues
24 present in this proceeding. Obviously, if the Board has any questions, we'd
25 be happy to jump to any of the topics that are of interest. However, we were
26 going to focus primarily in our presentation on the two obviousness grounds.

1 One, in view of Wright '451, rendering the substitute claims 29 through 44
2 obvious, where we think the case law is pretty clear that the when we have
3 overlapping disclosures, that the burden shifts to Patent Owner and they
4 need to show unexpected results, what they failed to do. The second topic
5 we would discuss is obviousness of De Bruyn in view of Takamura. Again,
6 we have a combination that renders the revised substitute claims 29 through
7 44 obvious. And the primary argument provided by Patent Owner is that
8 there was no motivation to combine those references. And the final ground
9 that we probably want to address is the written description because there's no
10 flow rate. And then we would reserve the topics of indefinite, assigning
11 procedural arguments for rebuttal if necessary.

12 So, moving on to slide 3, where we're going to introduce the
13 background of the technology. And as we look at slide 4, it's revised
14 substitute claim 29, and we can see that the Patent Owner has added claims
15 terms related to the temperature of the reaction, the calcium-promoted
16 gamma catalyst, and the temperature of calcination. And as we move to
17 slide 5, we are presenting Dr. Taber's testimony, who's Patent Owner's -- or
18 Petitioner's expert. And he's testified that the steps of the claims are well
19 known and widely used, and they've been practiced for decades, and that
20 there is nothing specific about these claims that is patentable. And they have
21 -- and Patent Owner hasn't really provided any evidence to show that what
22 they've done is different than what's been known in the art for an extended
23 period of time.

24 And then we're going to introduce some of this background
25 technology on slide 6, which allows this, just give us an understanding of
26 what a person's skill in the art would have known at the time of the filing of

1 the '048 Patent. And it'll start with some of the earliest references are related
2 to the dehydration of octanol and heptanol over gamma-alumina catalysts
3 that achieved fairly robust results. Then in the '80s, we had Wu, that kind of
4 discussed how you would treat the calcium, the gamma-alumina, so that way
5 you could improve conversion selectivity. We had Berteau and Cortez,
6 which both discussed studies of why Wu's findings are correct, like, what
7 happens when you've treated the gamma-alumina with various alkali earth
8 metals, alkali metals. And then Voste also is of record, and that discusses
9 how person of skill in the art knew how to modify a catalyst with the alkali
10 earth metals. And they were actually attempting to iterate on that and
11 improve the process via an ammonia addition instead.

12 JUDGE HULSE: Counsel, there is some question raised by Patent
13 Owner's expert about the relevance of these types of references that are, I
14 guess, disclosing solid or liquid phase catalysts versus gas phase. Could you
15 address that, please?

16 MR. MURPHY: Yes, Your Honor. So, I believe that was specifically
17 with respect to Takamura, which is Exhibit 1044. And we rely on that with
18 respect to combination with De Bruyn. And they, Patent Owner has argued
19 that the disclosure is inapplicable, again, as you mentioned, because of its
20 liquid phase versus gas phase. And we would just say that we think that
21 that's kind of a mischaracterization of how the references are being
22 combined. We rely on Takamura for the idea that you can impregnate a
23 catalyst with metal oxide, calcine it, and end up with the end result of a
24 calcined gamma-alumina catalyst. And it's impregnated with a metal oxide,
25 and we combine it with De Bruyn. And De Bruyn tells you explicitly that
26 they want a calcium oxide element in the gamma-alumina. So, we're not

1 relying on Takamura for an acid catalyzed reaction. We're relying on it for
2 the idea that you could impregnate and calcine a gamma-alumina catalyst.
3 And De Bruyn, which is what it's in combination with, specifically mentions
4 that they want the basic environment for the reaction and not an acidic
5 environment. So, we're not trying to take the acid catalyst from Takamura.
6 We're just trying to take the impregnation and calcination steps from
7 Takamura, because we already have the metal oxide that De Bruyn already
8 tells us which metal oxide we want. We don't need to rely on Takamura for
9 their metal oxide.

10 Related to these individually, I believe each of the ones on this slide
11 are gas phase reactions. Appleby and Komarewsky are both gas phase from
12 back then from the forties. Wu is a gas phase. So, I think these are all gas
13 phase reactions that we are addressing here in the background. So, I think
14 that's the only one, is Takamura. And also, a side note on Takamura is that
15 it does also address that you can have it take place at the boiling point of the
16 alcohol in question. So, we think in totality, it's a valid combination with De
17 Bruyn. And that it -- and we're taking the teachings that allow you to calcine
18 the metal oxide catalyst to create the end result that De Bruyn already tells
19 you that it wants.

20 JUDGE HULSE: So, then if you have a gas versus liquid phase
21 catalyst, then can you not compare the conversions and the regioselectivity
22 that results from those two types of catalysts? Do you agree with that?

23 MR. MURPHY: Are you asking if the liquid phase would have the
24 identical conversion as the gas phase? I guess I don't know that we know
25 the answer to that. I know that they both achieve the results that are
26 expected. That you can take the gas phase that De Bruyn already teaches

1 with the catalyst that it already teaches, and you can create that catalyst via
2 the impregnation process. So, we don't really need to rely on the liquid
3 phase results of Takamura. We're just relying on the process of creating the
4 underlying catalyst that is, again, is consistent with the art. There's a
5 textbook, Exhibit 2002 that is filed with the Patent Owner's materials that
6 walks through the incipient wetness impregnation of a catalyst. It's
7 consistent with Wright, which also talks about the incipient wetness
8 impregnation of a catalyst. And it's consistent with, I believe Berteau also
9 does the same calcination steps between the acid and the base catalyzed
10 reactions. So, it's widely applicable to the -- it's consistent with the rest of
11 the prior art that's of record.

12 JUDGE HULSE: Thank you.

13 MR. MURPHY: Mm-hmm. So, just stepping back through the
14 proposed substitute claim 29 Patent Owner's provided the arguments and
15 amendments that typically appear to be at dispute between the parties are
16 related to the temperature of the reaction and the temperature of the
17 calcination. And so, as we move to slide 8, just as again, further kind of
18 background of where a person still in the art is. Dr. Wright, who's Patent
19 Owner's expert, discussed that when an operator has a known catalyst, a
20 known reaction, that they can alter the feed rate and the temperature of the
21 reaction to achieve, he calls it a sweet spot of selectivity and conversion.
22 This is consistent with Dr. Taber's testimony that, again, that there's multiple
23 sufficient conditions that achieve the results that a person of ordinary skill is
24 looking for. And so, once we have this information, we're able to achieve
25 the results that a person of ordinary skill in the art wants to achieve.

1 Now, as we move to slide 9, we're addressing specifically the ground
2 of Wright '451 and how it renders obvious claims 29 through 44. So, with
3 Wright '451, again, the disclosure of Wright '451 has all of the elements of
4 the revised substitute claims. It has overlapping disclosures of the reaction
5 temperatures, has overlapping disclosures of calcination temperatures, and it
6 has evidence of achieving the regioselectivity and convergence that are
7 recited in claim 29. And once we have these overlapping disclosures, the
8 burden shifts to Patent Owner to show that they have unexpected results that
9 would rebut the presumption of obviousness that is provided by the
10 disclosure of Wright '451. And as we'll show, we don't think that Patent
11 Owner achieved their burden.

12 And moving to slide 11, we can address where Wright '451 explicitly
13 discloses the dehydration temperature. And as we can see, when we take the
14 output into the reactor, we put it in at an elevated temperature and explicitly
15 discloses that the temperature should be 200 to 440, or about 300 to 420.
16 And so, again, we have an overlapping disclosure of the elevated
17 temperature. And on slide 12, we refer to Dr. Wright's deposition, Exhibit
18 1040, where when he was asked about the disclosure of Wright '451 and
19 about what it disclosed, he agreed that it taught that the temperature could be
20 200 to 400 degrees, and that a person of skill in the art would understand
21 that the dehydration reaction can take place at those temperatures.

22 There's also examples in Wright '451 that achieved these results. On
23 slide 13, we are discussing table two of Wright '451, with focus explicitly on
24 examples 12, 13, and 14. As can be seen, the temperatures of these reactions
25 were at 360 degrees within the claimed range. And as we can see, the
26 conversions and selectivities were also appropriate for the -- within the

1 claimed results that they wanted to achieve. So, we have overlapping
2 disclosure and explicit examples that all achieve the claimed results.

3 JUDGE HULSE: Counsel, that was for -- can you go back one slide,
4 please?

5 MR. MURPHY: Yes.

6 JUDGE HULSE: That's for bio-1-butanol results. Can you -- I
7 guess. Can you apply the results for butanol to the claims which require,
8 what, six to ten carbons, I believe it is?

9 MR. MURPHY: Yes, Your Honor, I think there's two points on that
10 front. One is that the disclosure of Wright '451 itself contemplates the
11 alcohols being longer than just butanol. It encompasses, I think, up to 20
12 carbon chain length. And also, Dr. Taber has testified that once you have
13 the results from a butanol, they would apply up to, at least up through the 20
14 carbons. And there's no technical reason why those results wouldn't be
15 applicable beyond just the butanol results we have here. So, I think with --
16 and also, if we just think about as the background of the art, we know that
17 these are successful reactions, because, as we talked before, we had Appleby
18 and Komarewsky, those papers from 1940 that achieve dehydration with
19 octanol and heptanol. And then we have multiple other references that
20 achieve these same results in this temperature range. So, we think the
21 weight of this evidence is that, including Dr. Taber's testimony, that we can
22 apply these general reactions to the longer chains and achieve the results that
23 are disclosed within Wright '451 itself.

24 JUDGE HULSE: What do you make, then, of the statement in the
25 specification of the '048 Patent? I'm looking at column 7, lines 39 to 42.
26 The statement, "However, even with such a result for bio-1-butene, it is

1 noted that the conversion of 1-octanol to 1-octene, is not simply a homolog
2 of a conversion of 1-butanol to bio-1-butene.”

3 MR. MURPHY: Yes, Your Honor. I would take that to mean that it's
4 a patentee that's talking up their own proposed invention. There's no
5 evidence provided within the patent itself that this is limited to, that these
6 results are limited from four to six. There's no technical evidence provided
7 to that. The '048 Patent itself contemplates, you know, ranges that are the
8 carbon lengths within these ranges. The originally filed claims, as this
9 Board found, included, you know, four, and there's nothing, you know,
10 carbon chain length of four, and there's nothing that they've provided that
11 would show that it operates differently at six than it did four. And so, I think
12 the, again, the bulk of the evidence is that the teachings of Wright '451
13 contemplate and show that you would achieve these results. And then the
14 examples are just further evidence that this catalyst works to achieve the
15 selectivity and conversion. So, I think it's a two-pronged answer in that
16 there's explicit disclosure of broader applicability and the examples, and
17 we're not limited to just the examples, that there are further evidence that
18 what Wright '451 stands for includes more than that and is successful.

19 JUDGE HULSE: Thank you.

20 MR. MURPHY: Mm-hmm. The next area of dispute between the
21 parties is related to the calcium-promoted and calcined gamma-alumina
22 catalyst. And Wright again, '451 does, excuse me, does disclose both of
23 these elements, as you can see Wright '451, this is slide 14, referencing
24 Exhibit 1039 that they talk about a gamma-alumina support that is then
25 treated with a calcium compound. And then moving on to slide 15, Wright
26 '451 then talks about how you would actually take this treatment to the --

1 apply this treatment to the catalyst, where they discussed that you would
2 have an incipient wetness impregnation, and that typically after an incipient
3 wetness impregnation, you end up with a calcination process. And then they
4 explicitly disclosed that this calcination process would take place again at
5 about 200 to 400 degrees C, or 200 to 600 degrees C for a period of 1 to 8
6 hours.

7 On slide 16, we're discussing, or we excerpted Dr. Wright's testimony
8 again when asked about the calcination range in Wright '451. And he
9 concedes that it's possible to calcine the catalyst within this range and that
10 those are the ranges that are taught. So, after the overlapping ranges are
11 found to be in the prior art reference, Patent Owner has argued that instead
12 of -- or that, they can rely on unexpected results to overcome the
13 presumption of obviousness, in light of Wright '451.

14 A couple of things that we wanted to keep in mind as we go through
15 the unexpected results analysis is that the unexpected results have to be for
16 the entire claimed range. So, it's not just the small part of it, but we need the
17 entire claimed range supported. And we also note that In re Giesler
18 discusses how just optimizing within a range is not really an unexpected
19 result. And they show, say that you need a, something that happens that
20 actually shows that it's a, it's a large result and it was unexpected there.
21 They contrast it with another case where there was a 50 fold increase versus
22 the, I think it was like a 20 percent increase in their case. And they said, you
23 know, the 50 fold increase is an unexpected result and the 20 percent
24 increase was -- didn't qualify.

25 And so, as we switch to slide 18, we'll address the first issue that a
26 Patent Owner has argued is unexpected, which is the 1-octane

1 regioselectivity. And what they point to in their revised motion to amend is
2 that they have achieved regioselectivity of 96.7 percent. And what we
3 would point out is that this is not unexpected at all. The prior art Wright
4 '451 explicitly talks about achieving greater than 95 percent alkene
5 production. They have a paragraph 82 which discusses 90 to 98 percent
6 regioselectivity. They even have a paragraph related to achieving 90 to 99
7 percent regioselectivity after 48 months. So, Wright '451 pretty explicitly
8 contemplates achieving these results of about 96 percent regioselectivity.

9 And on slide 19, we provided some further citations that show that
10 this is consistent with Wright '451, and then it's not unexpectedly better over
11 the applied prior art. Also on this page, we discuss their motion to amend,
12 where they've argued that the base treatment followed by calcination
13 achieves 97 percent regioselectivity and 97 percent conversion from a
14 temperature range of 400 to 480. And what this is saying is that there's
15 unclaimed subject matter, 400 to 420, that achieves the exact same
16 regioselectivity as the claimed subject matter of 420 to 480. And so, the
17 argument should be that this is consistent both inside and outside of the
18 claimed range. And when you have consistent results both inside and
19 outside the range, it can't be said to be unexpected.

20 Moving on to slide 20, the second argument that they make for
21 unexpected results is that the conversion of 1-hexanol decreases at the
22 temperature of 370 degrees when the prior art would, you would expect it to
23 increase at 370 degrees. And so, they say this result is unexpected.

24 At slide 21, we excerpted part of Dr. Wright's deposition testimony,
25 where he clarifies what conversion means in this context. And what he
26 states here is that 95 percent conversion means the alcohol has been

1 converted to something. It's not necessarily a specific result, it's just that the
2 alcohol has been converted to something else. And so, when we look at the
3 results, the underlying results that Patent Owner has cited, they cite to their
4 example 11 in the '048 Patent, and specifically table 5. And when we look
5 at the results that are actually in table 5, we see that the hexanol conversion
6 is actually relatively constant. It's from 1.8 percent to 1.6 percent hexanol
7 coming out of the reactor, which means we have a pretty consistent
8 conversion throughout the three reactor temperatures that are here. And --

9 JUDGE HULSE: Counsel, I'm sorry to interrupt. Do you agree with
10 Dr. Wright's interpretation of conversion or definition of conversion?

11 MR. MURPHY: Yeah, the conversion of the alcohol would be that
12 it's converted to something different. So, we know that conversion is that
13 you check to make sure there's not the hexanol in the -- exiting the reactor,
14 effectively.

15 JUDGE HULSE: Well, but --

16 MR. MURPHY: And --

17 JUDGE HULSE: -- I'm looking at the claim language, excuse me,
18 wherein the resulting bio-alkene is, you know, dot, dot, dot, is produced in a
19 conversion of at least 95 percent.

20 MR. MURPHY: Mm-hmm?

21 JUDGE HULSE: So, you don't look at the percentage of hexenes that
22 are produced and you only look at the 1-hexanol here. Is that correct?

23 MR. MURPHY: That's correct, Your Honor, because the 1-hexene
24 would be normally referred to as you'd have a yield of 1-hexene based on the
25 conversion of the 1-hexanol. And so, normally, if we, when we're looking
26 through the prior art, when the conversion of the alcohol is discussed, it's

1 discussing the amount of the starting alcohol that's converted to something
2 in the reaction. And when the prior art, and, you know, throughout the all
3 the art in this proceeding, I believe, they all refer to something like a 1-
4 hexene would be a yield based on the reaction. So, it's kind of a different,
5 it's not typically referred to as conversion of the 1-hexene.

6 JUDGE HULSE: So, then in this case, table 5, the conversion of
7 example 11A would be 98.2 percent?

8 MR. MURPHY: Yes, Your Honor.

9 JUDGE HULSE: Okay, thank you.

10 MR. MURPHY: And just to clarify what their argument actually was,
11 they say the conversion of 1-hexanol would decrease at 370 degrees. So,
12 even if they meant to, or even if they wanted to discuss the 1-hexene, that's
13 not the argument they actually put forward. The actual, I mean, what they're
14 saying is that the 1-hexanol conversion decreases. And so, when we look at
15 the 1-hexanol level, again, we end up with, you know, pretty consistent
16 results. And the reason for that is the design of the experiment was to
17 maintain 1 and 2 percent hexanol passing through, which, again, as we
18 mentioned, is a, you know, 98 percent to 99 percent conversion.

19 Now, to your specific question about -- to follow up on your specific
20 question is, you know, what, what do we do with this hexene, if we wanted
21 to rely on that, if that was something that the Board found they wanted to
22 rely on or Patent Owner did, we would still argue that there's nothing
23 unexpected about this reaction. The reason we would say that is because the
24 -- we'll move on to slide 23 here, is that what the design of the experiment
25 shows is that they want to maintain conversion at a constant temperature.
26 And as Dr. Taber has testified, the most likely reason, or the most likely

1 method of achieving that, it would be increasing the flow rates. And so,
2 when you increase the flow rates, you reduce the time on catalyst for the
3 reactants.

4 And what the results of example 11C here show is that you end up
5 having this, you know, a new peak in the measurements where we get 3.6
6 percent. And that Dr. Taber's testimony is that this is most likely one of the
7 intermediate ethers. And so, you end up with, because you don't have
8 enough time for the intermediate results to finally convert to the 1-hexene,
9 you would have a lower 1-hexene result, and that would be entirely in line
10 with the expectations of a person of skill in the art. And so, you end up
11 with, even if there was a reliance on the 1-hexene product, it's still not a
12 difference that would be unexpected based on the information that we have
13 about example 11.

14 So, to wrap up the obvious is over Wright '451. We think that the, the
15 disclosure of '451 teaches each element of substitute claims has overlapping
16 disclosure, and that Patent Owner has failed to show any unexpected results
17 based on the evidence that they've provided.

18 Turning now to the second topic we'd like to discuss, which is
19 obviousness over De Bruyn in view of Takamura for the revised substitute
20 claims 29 through 44. And for this ground, we have De Bruyn, which
21 explicitly teaches the dehydration of hexanol and octanol involving a
22 calcium modified gamma-alumina catalyst. And we have De Bruyn, which
23 can be combined with Takamura for the catalyst preparation, which we
24 briefly touched on earlier, and that we would have the expected results of the
25 De Bruyn reaction. Patent Owner's really only arguments here are related to
26 the combination of the references, instead of related to the disclosure of

1 references themselves. However, as we move to slide 27, we'll walk through
2 briefly how the references themselves discuss each of these limitations, and
3 then we can walk through why the combination is proper.

4 So, going to --

5 JUDGE HULSE: Sorry, can I interrupt you before you begin?

6 MR. MURPHY: Sure.

7 JUDGE HULSE: Can you point me to where you are relying on,
8 which reference or combination of references you're relying on to show the
9 bio aspect of the claims, the bio-1-alcohol or bio-1-alkene?

10 MR. MURPHY: Yes, there's two answers to that question, Your
11 Honor. In the original institution decision, the Board indicated that they
12 were. That there was no technical difference between the bio and the
13 petroleum based disclosures, that there was no technical difference between
14 them, and if there was a need for it, there was ample evidence supplied that
15 the references, like Li (phonetic), for example, and a number of other
16 background references, show that the bio-based alcohols were readily
17 available. And Patent Owner did not provide any evidence that there was
18 any reason why the bio aspect of this was important or defining in a
19 technical sense. And so, they haven't raised it as an issue. And also Patent
20 Owner has relied, their unexpected results rely on their examples in the
21 specification that utilize petroleum based alcohols. So, it seems like, from
22 Patent Owner's perspective, that they've conceded that the bio-based portion
23 of this is not a distinction. However, to the extent that they do want to
24 maintain the argument that bio is important, then that would cut against their
25 ability to rely on the unexpected results of the examples that use a petroleum
26 based product.

1 So, from our perspective, in our original filing and Dr. Taber's original
2 declaration, we argued that the bio aspect of this is more or less a marketing
3 or a disclosure of that nature. It's not a technical difference, and that a
4 person of skill in the art would be able to use both bio or petroleum based, or
5 a mixture of the two, and they wouldn't be able to notice the difference. And
6 so, from our perspective, that is the basis on which we're moving forward
7 with this rejection. And if the Board needs to rely on just background that it
8 was bio, alcohol was available, because it would just be you get to buy bio
9 or you get to buy petroleum, but that would just be a design choice or not of
10 any sign, you know, specific technical impact.

11 JUDGE HULSE: Thank you.

12 MR. MURPHY: Mm-hmm. So, pointing to, specifically to paragraph
13 37, where they discuss that all these different dehydration processes are
14 known, and that the temperatures, again, are again an overlapping disclosure
15 of 200 to 450. And also, they have a disclosure that's within the claimed
16 range of 250 to 350. So, it's actually completely within the claimed range.

17 De Bruyn also has some specific examples that operate at the
18 appropriate temperatures. They operate the reactor at 315 degrees to
19 achieve, you know, results that are 94 percent to one of the 1-hexanol was
20 converted to alkenes, which Dr. Taber's testified, what a person of skill in
21 the art would understand is greater than 94 percent, since there's going to be
22 byproducts associated with any reaction. And then we also see that they
23 have a 97 percent selectivity towards hexenes. So, based on both the
24 disclosure itself and some examples, we are operating a reactor in the
25 appropriate temperature range.

1 On slide 29, we have a different example from De Bruyn, which once
2 again operates within the claimed temperature range. And it teaches that
3 you can get octane fractions greater than 95 percent at high conversions. Dr.
4 Wright compiled these various experiments into a table, and it kind of lays
5 out what did steps De Bruyn, what the reactions in De Bruyn presented.
6 And as we can see, the regio selectivity is high from 96 percent to 98
7 percent. We see that as temperatures increase and flow rates decrease,
8 conversion increases. We do note that the 94 percent does involve a recycle
9 stream, but the overall results of the reactions are that we have temperatures
10 and regio selectivities that are appropriate for the claimed features.

11 Moving on to the calcium-promoted calcined temperature range, De
12 Bruyn explicitly discloses that we can have a calcium modified catalyst, a
13 calcium-promoted gamma-alumina catalyst. And that the -- can be kind
14 with Takamura. And Takamura specifically walks through a number of
15 steps about how to impregnate the gamma-alumina catalyst, and then how to
16 calcine it afterwards, and how you would want to do that so, that you can
17 maintain the dispersion throughout the support element, and how you can
18 prevent the reduction of surface area.

19 So, when De Bruyn explicitly discloses that you would want to use
20 the calcium alumina to promote the -- the calcium oxide, to promote the
21 gamma-alumina, then you would, a person of skill in the art would look to a
22 specific example of how that happens. And Takamura specifically walks
23 through some steps on both temperature for impregnation time, then the
24 calcination temperatures.

25 Again, we kind of touched on this a little bit briefly. So, we'll try to
26 not spend too much time on it here. But the two arguments primarily, or

1 maybe a combination of one argument. But POSITA -- the Patent Owner,
2 discusses that there's really just no -- they basically say there's no reason to
3 use it because there's commercially available catalyst. And then that there's
4 hindsight required in order to choose the topics from Takamura to combine
5 with De Bruyn.

6 Again, we would disagree, because again, as we talked about briefly
7 earlier, is that the dehydration processes are known. They want the
8 dehydration to be taken place under a basic environment. And they
9 explicitly describe what that basic environment is, which is including the
10 calcium oxide as one example. And then we get into the actual section of
11 Takamura --

12 JUDGE HULSE: Counsel?

13 MR. MURPHY: Yeah?

14 JUDGE HULSE: Counsel, I'm sorry, you have about four minutes
15 left.

16 MR. MURPHY: Okay, then we'll try to get through this one. And we
17 look through the background of Takamura, and it explicitly says we have an
18 aluminum oxide that is impregnated. Again, we have time, temperature, and
19 then the reasons why a person skilled in the art would want to calcine this --
20 the gamma-alumina with the calcium. And we end up with the calcium
21 oxide promoted gamma-alumina catalyst that De Bruyn explicitly discloses.
22 And again, we don't think that hindsight is applicable because De Bruyn
23 itself says we would like to operate the calcium oxide in a basic
24 environment. And that's what a person skilled in the art is going to use. So,
25 we think that it teaches all the elements are there and that the combination is
26 proper.

1 We'll briefly touch on no written description support. On slide 38, the
2 revised substitute claims discuss how there's 95 to 99 percent
3 regioselectivity and conversion, as we previously discussed. And Dr.
4 Wright opined that in order for the selectivity and conversion that you need
5 to know a flow rate or is largely a function of flow rate. And as we see
6 through the specification of the '048 Patent, there's largely no discussion of
7 flow rate, how flow rate impacts conversion, how it impacts regioselectivity,
8 and instead, there's a number of examples that just say you want to adjust it.
9 When this argument is presented, Patent Owner relies on example 5 of the
10 '048 Patent, which discusses 0.2 ML/minute into the reactor at 315 degrees.

11 And as we move to slide 41, we can see that the example 5 only
12 provides enough information to say that there's selection to octenes, but not
13 which octenes are being selected. And there's not enough information to
14 determine if it's 95 percent 1-octene, if it's 90 percent 1-octene. We have
15 very limited information. And again, there's not any other information and
16 specification that would really lead a person of skill in the art to understand
17 that Patent Owner possessed an invention that included 95 percent
18 conversion with 95 to 99 percent regioselectivity at every available flow rate
19 that was known.

20 JUDGE HULSE: Counsel, what's your response, though, to the fact
21 that flow rate is not a claim limitation?

22 MR. MURPHY: Well, I think that the problem is that how would a
23 person skill in the art know that they possessed an invention that achieved 95
24 percent conversion and 95 percent regioselectivity? A person of skill in the
25 art needs to know what the flow rate is or when this catalyst will work to
26 achieve those results. So, the fact that it's not claimed is a negative for them,

1 because if there was a specific range claimed, they might have an argument
2 that you could argue support for a claimed range that would be limiting the
3 disclosure. But right now, we don't know if it works for industrial
4 applications. De Bruyn's talking about pushing, you know, I think it's a
5 weight hour space velocity of, like, 10 through the reactor. Would this
6 catalyst work under those circumstances? Would it work under bench scale
7 circumstances? The problem is, is that the specification itself doesn't
8 explain it. The examples themselves don't explain it. There's only one
9 disclosure that isn't even, they don't really argue is representative of larger
10 flow rates or smaller flow rates. And so, the fact that it's not claimed doesn't
11 lead a person of skill in the art to understand what the actual scope of the
12 claim is, or how to, or that they possessed a flow rate that did work.

13 JUDGE HULSE: Counsel, you're right at 40 minutes. Would you
14 like to continue, or would you like to reserve the rest of your time?

15 MR. MURPHY: I would not. I will reserve the rest of my time.
16 Thank you.

17 JUDGE HULSE: Patent Owner, would you like to reserve time?

18 MR. LUKAS: Yes. Thank you.

19 JUDGE HULSE: And if so, how much?

20 MR. LUKAS: Thank you, Your Honor. I will reserve whatever time
21 I have left after going through this. I'm guessing it's going to be about 10
22 minutes. Obviously, indefiniteness was not discussed or estoppel. So, to the
23 extent those are going to be discussed on rebuttal, I'll reserve some time to
24 provide a sur-rebuttal.

25 JUDGE HULSE: Mm-hmm.

1 MR. LUKAS: But if I could please start. May it please Court, Your
2 Honors, Aaron Lukas, on behalf of Patent Owner Inolex. And this case is all
3 about the credibility of the experts. And in particular, you have, on the one
4 hand, Dr. Mike Wright, who has an extensive background in industrial
5 chemistry. He's also worked in academic labs and he's been a senior
6 scientist for the U.S. Navy. He has more than 30 years' experience in
7 catalysis, and he's co-authored more than 100 peer reviewed publications.
8 And he's an inventor on more than 40 patents, notably the patent at issue
9 here today, the '048 Patent. Petitioner's expert, on the other hand, Dr. Taber,
10 who you heard a little bit about in Petitioner's demonstration, is an emeritus
11 professor. He has no experience in working in an industrial setting. And
12 you'll see today, he made numerous admissions on cross-examination that
13 undermine his testimony and his conclusions as it relates to written
14 description, indefiniteness, and obviousness. His testimony on these issues
15 should be accorded little probative weight.

16 Also important in this case is that Dr. Taber has received more than
17 \$40,000 in compensation in providing his opinions. On the other hand, Dr.
18 Wright received no compensation from Inolex in providing his three expert
19 declarations or for his time being deposed. Therefore, Your Honors, I
20 believe that the evidence and the record will show that Dr. Wright's
21 testimony in this proceeding should be accorded significant probative weight
22 over that of Dr. Taber.

23 And why is this important? Well, first and foremost is the level of
24 ordinary skill in the art. In this case, Your Honors made a preliminary
25 finding in paper seven, that a person of ordinary skill would have a
26 bachelor's degree and two or more years of experience or a master's degree.

1 And this is important because, like many other chemical cases that come
2 before this tribunal, this field is very unpredictable. And so, would a person
3 of ordinary skill be able to make insights, be able to make inferences beyond
4 the examples that are disclosed in the prior art? I respectfully submit the
5 answer should be a resounding no, based on Dr. Wright's testimony and his
6 extensive experience in this area.

7 What is more, while this field is unpredictable, as I mentioned, the
8 skill in the art is considerably lower than it is in other chemical arts. So,
9 normally, if you're dealing with a medicinal chemistry issue, the person of
10 ordinary skill in the art may very well have a doctorate or even postdoctoral
11 experience. That is not the case here. Your Honors. So --

12 JUDGE POLLOCK: Mr. Lukas.

13 MR. LUKAS: -- going to slide 5.

14 JUDGE POLLOCK: Mr. Lukas?

15 MR. LUKAS: Yeah, sorry about that. Yes, Your Honor.

16 JUDGE POLLOCK: Judge Pollock. Would you explain to us your
17 evidence underlying why you think this field is so particularly
18 unpredictable?

19 MR. LUKAS: Well, I think, first of all, Your Honor, catalysis
20 generally, there's been numerous decisions over the years finding that
21 catalysis is unpredictable. So, taking a specific catalyst, and then, so, what
22 are you going to do with it? Are you going to chemically modify it? What
23 is that chemical modification going to do, not just to the catalyst, but to a
24 particular substrate?

25 So, in this area, and I think I'd like to refer you to Makgoba Exhibit
26 1027, which is background art. It's a publication from the same inventors

1 that worked on the De Bruyn reference. And they talk about, well, look, we
2 always are seeking to optimize in this area, and they conducted an in-depth
3 analysis and determine that potentially, at least when it comes to
4 petrochemical feedstocks, Your Honor, the fact that those feedstocks may
5 contain silicon can lead to poisoning of these gamma-alumina catalysts.
6 This is just one instance of unpredictability where you might be seeing a
7 result where you have reduced conversion over time. And that's exactly
8 what Makgoba is showing, and it's what De Bruyn was showing also.

9 What is that from? Well, a person of ordinary skill in the art, with a
10 bachelor's degree and only two years' work experience, is not going to have
11 that insight to be able to say, well, okay, I understand the chemistry of these
12 catalysts, so that I could take the teachings of one substrate or one catalyst,
13 and then apply them and interchange them in ways that would lead to similar
14 results with other substrates or with other catalysts. And I think the
15 testimony and the evidence of record will show that, Your Honor.

16 JUDGE HULSE: Mr. Lukas, are you saying that Dr. Taber is not
17 qualified to opine from the perspective of a person of ordinary skill in the art
18 as we've defined it in our DI?

19 MR. LUKAS: He certainly is a person of ordinary skill in the art. I
20 don't think that is in dispute. I don't think he has experience in
21 heterogeneous catalysis, particularly gas phase catalysis that is at issue for
22 this patent. So, from, in terms of his testimony as to what a person of
23 ordinary skill in the art would do, frankly, I don't view it as credible as Dr.
24 Wright's testimony. So, is he a person of ordinary skill? Yes. Is he
25 providing testimony that's reliable and more credible than our expert? No,
26 Your Honor.

1 JUDGE HULSE: Do you think that our definition of a person of
2 ordinary skill in the art should include that experience of, I'm sorry. You
3 said it very quickly. Heterogeneous catalysis?

4 MR. LUKAS: Well, certainly, Dr. Taber testified, Your Honor, at his
5 first deposition that a person really skilled in the art would very well likely
6 have industrial experience or experience working at a company. And that
7 was highlighted in our first motion to amend. So, whether -- we, for
8 purposes of this proceeding, have adopted the Board's definition of a person
9 of ordinary skill in the art. Obviously, you're free to change that definition.
10 In making a final written decision, we do believe that industrial experience is
11 important. Would every person of ordinary skill in the art have that?
12 Obviously, there are some academic labs that do heterogeneous catalysis.
13 There potentially are a wide range of different places this type of work could
14 happen.

15 But I think what's important here is that Dr. Taber, and I think you
16 made light of this in Petitioner's presentation, was relying on background art,
17 such as sophomore level organic chemistry texts, as well as Takamura, for
18 example, that deal with liquid phase chemistry. And as I'll explain in this
19 next part, that would not be relevant for a person of ordinary skill in the art.
20 And a person of skill in the art would have looked to gas phase
21 heterogeneous catalysis. For example, I believe Exhibit 2002, the Ross
22 Heterogeneous Catalysis book. These are the type of texts that a person of
23 ordinary skill would look at for this specific technology.

24 And I'd like to just, I don't think claim construction was necessarily an
25 issue, but there was a question about what is conversion, as it's recited in
26 substitute claim 29. And I believe Counsel for Petitioner said that

1 conversion just means that you're converting hexanol to something else.
2 And I respectfully disagree. I believe the words of the claim are very clear.
3 The resulting bio-alkene, with a carbon chain of 6 to 10 atoms, it's produced.
4 So, the bio-alkene is produced in a conversion of at least 95 percent, which
5 means that at least 95 percent of that alkanol, the bio-1-alcohol, is converted
6 to a bio-alkene. Now, that could be a bio-1-alkene, a bio-2, a bio-3. It just
7 means that it is alkene. It's no longer alcohol. It is now alkene. That's what
8 the words of the claims say on their face. And the second part then looks at,
9 okay, of that 95 percent of alcohol that you've converted to alkene, what
10 percentage has to be a 1-alkene? And it has to be 95 to about 99 percent.

11 Are there any questions, Your Honors?

12 JUDGE HULSE: Then can we go to table 5 of the '048 Patent?

13 MR. LUKAS: Yes. And let me find that for you. Table 5.

14 JUDGE HULSE: Or any table that shows --

15 MR. LUKAS: My apologies, there are a lot of slides.

16 JUDGE HULSE: Yeah, this is fine. This is fine. Go back.

17 MR. LUKAS: Okay, so here's table 5. Yes, Your Honor.

18 JUDGE HULSE: Okay. So, in this example is the conversion, the
19 addition of 92.8 percent plus 3.5 percent conversion to the bio and alkene to
20 be --

21 MR. LUKAS: That's correct. And I think you see --

22 JUDGE HULSE: Okay.

23 MR. LUKAS: Yes, so, and Dr. Wright's testimony on this was.
24 Look, we have reduced conversion to hexenes in parens. So, the important,
25 the important conversion we're looking at isn't what's happening to the 1-
26 hexanol. It's what is being converted. And it's to hexenes that's important.

1 So, at 370, it's 93.3 percent from 96.9 at 350. And so, what we're looking at,
2 if you're going to look at the conversion, would be the sum of these two
3 columns.

4 JUDGE HULSE: So, Petitioner was relying on Dr. Wright's
5 testimony though, for the conversion definition that they were using. So,
6 what is your explanation for that?

7 MR. LUKAS: Yeah, so, respectfully, I think there's, the word
8 conversion is used interchangeably. It can either refer to what is the
9 conversion of your hexanol, or what is your conversion of two alkene
10 products. And I think those, you know, forgive the lack of precision here,
11 but conversion can mean either. But I think the claim, the wording in the
12 claim is very clear that the conversion at issue for this claim is the
13 conversion to alkenes.

14 JUDGE HULSE: Thank you.

15 MR. LUKAS: So, turning first, I'd like to go to Takamura and De
16 Bruyn, Your Honors. And that is ground 4 in Petitioner's opposition. There
17 was a lot of discussion about De Bruyn and what it discloses. And really,
18 when you look at De Bruyn, De Bruyn's not disclosing anything new. When
19 it comes to doing dehydrogenation reactions. De Bruyn's main goal is to
20 take less useful alkanols and alkenes, and convert them into longer chain
21 alkenes. Starting with, say, pentene, the goal of De Bruyn is to convert that
22 to hexene, which is more useful in industrial processes.

23 And so, De Bruyn's disclosure is, you can do that, you can provide the
24 dehydration, can proceed by any known process. But importantly, the
25 important thing is that it's preferably controlled to produce alpha-olefinic
26 compounds. And then De Bruyn provides a general disclosure, saying, look,

1 you can use alumina, silica, titania, zirconia. You can use a wide range of
2 temperatures for those reactions. You can use different pressures, even.
3 And then in some embodiments, it could comprise a gamma-alumina
4 catalyst that is promoted with calcium. But when we look at what De Bruyn
5 is doing in terms of conversion and selectivity, clearly De Bruyn is focused
6 on maintaining the 1-alkene regioselectivity. And you can see that here in
7 figure 2 of De Bruyn, where the black squares along the top are the 1-octene
8 purity.

9 Now, in order to achieve this high regioselectivity of 1-octene, De
10 Bruyn runs at a conversion that is much lower. It starts off a little over 70
11 percent, and even after a few hours' time on screen, time on screen goes
12 down below 60 percent. In order to improve the overall conversion, De
13 Bruyn is recycling. And so, you're basically taking the effluents from the
14 reactor and recycling them back through. So, remove the octene that you
15 want, recycle back the stuff that didn't react. And over time, by doing that
16 recycling, you can improve the overall conversion, which, in this case, was
17 able to go up to 98.6 percent. Sorry, that's selectivity. Ninety-four percent
18 hexanol was converted to alkenes.

19 So, again, and I would say again, this conversion is conversion to
20 alkenes. So, it's not -- De Bruyn himself or the authors in De Bruyn are not
21 talking about just the hexanol being used up. They're talking about what it's
22 being converted to, which, again, is part and parcel with what we're trying to
23 claim here in our substitute claims.

24 Now, turning to slide 50, Dr. Taber testified on cross. Well, okay,
25 looking at De Bruyn, if you want to increase the conversion, he says, well,
26 you need to go to slower flow rate or higher temperatures. And my question

1 to him was, well, okay, would you need to do an experiment to find out if
2 you could do that? And yes, absolutely. You couldn't predict whether or not
3 you could actually get that conversion. You would have to do the
4 experiment, which goes along with this unpredictability. Now, would a
5 person of ordinary skill in the art know that you could use a slower flow rate
6 or a higher temperature to, in theory, improve conversion? Yes. But would
7 you know that it's actually going to work with this catalyst, with 1-alkenol or
8 1-octanol? No, you'd have to do the experiment to find out.

9 So, his other testimony on this was, well, he says that the process in
10 De Bruyn is well understood and predictable. And he's saying this based on
11 the fact, look, they've been running it for year, they do so on a metric ton
12 scale. And so, the question is, a person of ordinary skill in the art, what
13 would they take away from the fact that Sasol has done this? Well, his
14 testimony was, you would just go ahead. They would know that De Bruyn
15 is using gamma-alumina, and they wouldn't care how it's treated. They
16 wouldn't know whether it was treated with calcium oxide. They wouldn't
17 know if it was calcined. They would just know that it could be purchased
18 from Sasol and that it works. And so, that is exactly what a person of very
19 skilled knee art would do, according to Dr. Taber.

20 Now, this is going back to Makgoba, which is Exhibit 1027. It is -- an
21 author of De Bruyn is also an author of Makgoba, and it provides similar
22 results in terms of both the hexane purity and the conversion that's achieved.
23 And again, Dr. Taber's testimony about what a person of ordinary skill
24 would do when they're confronted with, look, I've been tasked with going to
25 run a reaction and produce 1-alkene. They would, before they set about

1 doing any experiments to modify a catalyst, they'd just go look and see what
2 was commercially available.

3 Now, later, after substitute claims were introduced, Dr. Taber came
4 out and said, well, a person would absolutely know that the catalyst that
5 Sasol uses is a product of treatment with calcium acetate, followed by
6 calcination. And so, there's a couple problems with that statement. First of
7 all, it's not what he said the first time he was asked about it. And second of
8 all, if that is the case, if in fact, the catalyst that Sasol used that gave a high
9 regioselectivity, but a conversion in the 60 percent range, if that were the
10 fact, then how would a person of ordinary skill in the art, expect to achieve a
11 conversion above 95 percent? And why would you seek to then modify a
12 basic catalyst, a calcium acetate, calcium oxide promoted catalyst? Why
13 would you look at that and say, oh, well, Takamura, that's going to be the
14 reference I rely on to modify De Bruyn?

15 So let's, Takamura is a European patent that was filed by Kao
16 Corporation. It's about 10 years after De Bruyn, and it deals with liquid
17 phase dehydration reactions of alcohols over gamma-alumina catalysts that
18 are weak, that have acidic sites. So, there's no disclosure of any basic sites
19 that Takamura does any base treatment at all. Every single one of the
20 paragraphs in Takamura talks about acid-treated catalysts. And not to
21 belabor the point, but this goes back to Dr. Taber's opening declaration,
22 where he's talking about Wade, which is a sophomore level organic
23 chemistry book, and he's talking about the mechanism that 1-octanol
24 undergoes to form 1-octene.

25 And he talks about, well, it's acid catalyzed, so you have a proton
26 from an acid in solution gets added onto the alcohol. And anybody who has

1 taken software level organic chemistry knows, okay, that water in a polar
2 solution makes a good leaving group, and therefore you get the 1-octene as a
3 dehydration product. Dr. Taber's testimony is that that mechanism that's
4 disclosed in Wade would apply for both liquid and gas phase reactions. And
5 with all due respect, Dr. Wright strongly disagreed with that statement. And
6 if we look at Dr. Wright's testimony in his last declaration, he cites to
7 another article that was cited by Petitioners, Chokkaram, which is Exhibit
8 1041. And this discloses, it teaches some of the reactions that happen in the
9 gas phase.

10 So, there's no formation of a protic species necessarily. You have
11 basically gas phase octanol, in this case, two octanols, as described in
12 Chokkaram, it absorbs onto a hot catalyst surface. When that happens, any
13 one of three different reactions can happen. So, you can form a ketone,
14 which is provided here, which would be a dehydrogenation reaction. You
15 also have the possibility of doing a dimerization with a dehydrogenation to
16 form a di-2-octylether up here, which then can subsequently convert to an
17 octene and can also undergo isomerization. And then finally, you have the
18 possibility of doing a dehydration in the adsorbed phase, which can then
19 isomerize in the adsorbed phase or isomerize in the gas phase.

20 Now, if we look at Dr. Wright's testimony on this, so his point on De
21 Bruyn is, look, De Bruyn says that calcium promotion, calcium oxide
22 promotion is possible. I don't think we're walking away from that at all. In
23 fact, that's disclosed in Wright '451 as well. The issue is that given the
24 conversion and the regioselectivity provided by De Bruyn with a base-
25 treated catalyst, why would you look -- that operates by a totally different
26 mechanism, why would you look to an acid-treated catalyst suitable for

1 liquid phase reactions as a relevant teaching to then modify your base-
2 treated catalyst? There's simply -- and so, Dr. Taber's testimony on this in
3 his report was, well, they're all catalysts. The desired dehydration reactions
4 are well known. De Bruyn doesn't describe them in great detail. And so,
5 Takamura is just another reference that provides further details about
6 calcination. Well, it's notable there's a bunch of references in this case that
7 provide details on calcination. Chokkaram being one of them, that was
8 previously relied upon by Petitioners in their original opposition. They
9 decided to drop that in their reply and in their renewed opposition to our
10 revised motion to amend. So, it's no longer they had Chokkaram in view of
11 Wu as one of their combinations, as one of their grounds. That's gone now
12 we have De Bruyn in view of Takamura. And I can only suppose that
13 Takamura, or sorry, Chokkaram didn't have the requisite disclosure. And it
14 simply, Your Honors, smacks of their expert using hindsight to pick and
15 choose a reference that they thought better suited their needs. And this is
16 Dr. Wright's testimony in response is that a person of ordinary skill in the
17 art, would not view Takamura simply, first, because it's a gas phase, it's a
18 commercially available catalyst, and there's no reason to modify De Bruyn
19 to start with.

20 Second of all, you have acid treated versus base treated. How do you
21 combine those? Well, Petitioners say, well, you just used the calcination
22 procedure, why wouldn't you? Well, that calcination procedure that works
23 so well for Takamura is for an acid-treated catalyst. So, I asked the question
24 back to them, and I think Dr. Wright is clear on this. Why would you use a
25 procedure specifically designed for an acid-treated catalyst to then pick and
26 choose and make a base-treated catalyst that's calcine? There's simply no

1 motivation for a person having limited skill in this art to go and look at
2 Takamura and then pick and choose from those teachings.

3 And importantly, there's the expectation of success. It's not just a
4 motivation, it's also a, well, how can I expect this is actually going to work?
5 I have a totally different chemical species. There's nothing in De Bruyn that
6 talks about calcination. Wholly silent. I challenge you to find the word
7 calcination anywhere in the document De Bruyn. And they're saying, well,
8 not only would you calcine it, you would also look to this other reference
9 that deals with acid catalysts and use their specific process to calcine.

10 And finally, this isn't a situation where there's a finite number of
11 predictable solutions. In other words, there's literally thousands of different
12 ways these catalysts can be chemically modified. All of them have different
13 nuances in terms of what they're going to do to a particular substrate. I think
14 the prior art of record is pretty clear on that, that people have been doing
15 these reactions for more than 60 years, 70 years even. There is no
16 predictability in this art. And certainly, this is not an instance where obvious
17 to try, and the case law from that line would be applicable here. With all
18 due respect, this analysis in its entirety smacks of impermissible hindsight,
19 and I believe it should be rejected.

20 I'd like to now turn to Wright '451. And -- sorry. Importantly, Wright
21 '451, as Your Honors noted during the earlier presentation, is focused on
22 converting one alcohols that contain water and bio-n-butanol, or bio-1-
23 butanol is known to have a high concentration of water. It's typically
24 produced by fermentation. And that was the problem that Wright '451 was
25 trying to solve. And Wright '451 also focuses on the ability to do industrial
26 chemistry with a long time on stream. I think that's very important here.

1 And Wright '451 as well as the other Wright '788 reference, which is of
2 record, and that is, I believe, Exhibit 1009, both teach that a calcium-
3 promoted and then calcined and then silanized gamma-alumina catalyst
4 provides significantly higher time on stream with the requisite high
5 regioselectivity and conversion to bio-1-butene.

6 Dr. Wright's testimony is that he would have viewed either one of
7 these references, Wright '788, Wright '451 as the closest prior art, because
8 both are teaching the use of silanized gamma-alumina catalyst to improve
9 the time on stream for bio-1-butanol, which contains, which is known to
10 contain a significant amount of water. And I think Petitioners reference
11 some of Dr. Wright's testimony about this whole calcination temperature.
12 And we don't back away from the fact that Wright '451 does disclose
13 calcination, and it discloses a calcination temperature of 200 to 600 degrees.
14 That is the range.

15 The issue is that the temperatures that were actually used in Wright,
16 all of those deal with bio-1-butanol and all of the heating or calcinations that
17 are presented in Wright '451 are at 120 or 200 degrees for drying and 500,
18 550, or 600 degrees for calcination, with the overwhelming majority of all
19 the examples in Wright '451 being calcination at 550 degrees C. And so,
20 that's important. And also, the fact that bio-1-butanol is the only alcohol,
21 this is Dr. Wright's testimony, that was dehydrated in his work that he did on
22 Wright '451. No attempts were made to dehydrate any longer chain
23 alcohols.

24 And this is reflected in the background of the invention in the '048
25 Patent where it's discussing, look, we recognize that bio-1-butanol is in the
26 prior art. We recognize that gamma-alumina was used in those processes.

1 But lo and behold, when we used silanized calcium-promoted gamma
2 alumina, it didn't work the same for bio-1-octanol as it did for bio-1-butanol.

3 So, and this again goes to the unpredictability in terms of taking prior
4 art that deals specifically with one substrate and then analogizing it to other
5 substrates. And Dr. Wright's testimony has been, look, you wouldn't
6 necessarily know it's going to work. Could you try it? Yes, you could try it,
7 but you'd have no predictability in knowing that it's going to work. And the
8 examples in the '048 Patent show that the inventors here were able to get
9 something to work that is unexpected over the prior art.

10 Now, in terms of saying, well, Dr. Taber testified that, look, a person
11 of ordinary skill in the art would expect that the bio-1-butanol would behave
12 like bio-1-octanol, because there's this heptane in there. And a person of
13 ordinary skill in the art would, would say, well, there's heptane that's going
14 to drive some water out. And Dr. Wright responded to this and says, look,
15 that has nothing to do. The presence of heptane in the examples in Wright
16 '451 have nothing to do with driving water out. That is solely there as an
17 internal reference standard so that when the concentrations of the products
18 were measured, the inventors could know they would have an internal
19 reference standard to say, okay, we know how much heptane went in, we
20 know how much came out, we know it's not going to react, therefore, we
21 could quantify our results.

22 This is, again, Dr. Wright's testimony in Exhibit 2010. This again
23 goes to the unpredictability. You can't just analogize a given substrate with
24 conversion and regioselectivity from the prior art without actually
25 conducting the experiments. And again, this goes to Dr. Taber's testimony
26 on cross that a person of ordinary skill in the art would have a lot of options,

1 but you would actually need to do the experiments to see what worked. And
2 that's cited in Exhibit 2010, citing to Exhibit 2005 at numerous sections
3 where he's talking about experimentation being required.

4 JUDGE HULSE: And so, I guess --

5 MR. LUKAS: And again, so --

6 JUDGE HULSE: -- the case law says that prior art is -- a reference is
7 prior art for all that it teaches, right?

8 MR. LUKAS: Yep.

9 JUDGE HULSE: And you agree that Wright '451 teaches the claimed
10 temperature range and teaches the claimed conversions and the
11 regioselectivity percentages and all that, correct?

12 MR. LUKAS: I will acknowledge, Your Honor, that Wright '451
13 teaches the conversion and regioselectivity for bio-1-butanol. It makes
14 general statements in the background of the specification saying that this
15 should, or it could apply to C4 up to C20. And clearly that's not the case.

16 JUDGE HULSE: And are you saying that it's not enabled, that
17 Wright '451 is not enabled for anything other than bio-1-butanol?

18 MR. LUKAS: Well, I would say enablement has not been an issue in
19 this case. As you know, the Wands factors would instruct us as to whether
20 this is enabled for the full scope of what is disclosed. And at least here, of
21 those eight factors, the level of skill in the art is very low. And the
22 disclosure in terms of the examples is very narrow. It discloses a single
23 substrate. So, we haven't done that analysis. There's no expert testimony on
24 that issue. But I would say if you were to ask Dr. Wright now, is Wright
25 '451 enabled for a person of ordinary skill in the art to go and practice its

1 disclosure with octanol, for example? I believe he would say, no. He's not
2 here today.

3 JUDGE POLLOCK: Mr. Lukas, you're asking us to put a lot of
4 weight in Dr. Wright's testimony. How should we weigh the credibility of
5 his testimony, given that he is in fact an inventor on the '048 Patent?

6 MR. LUKAS: Yes, and I appreciate that question, Your Honor. I
7 believe, look, when Dr. Wright was informed that there was an IPR filed
8 against this patent, he volunteered to defend his work, as he put it, and his
9 invention that is described in this '048 Patent. And so, he believes in the
10 unpredictability. He does not believe that his own prior art was, in any way
11 would have predicted any of the results that are set forth in this '048 Patent.
12 And the fact that he did not require any compensation to do that, I believe is
13 fairly convincing that he is not trying to pull one over on this tribunal at all.
14 Rather, I believe it's Dr. Taber, whose testimony had been all over the place,
15 frankly, and, you know, should be, should be taken as having much less
16 probative weight.

17 JUDGE POLLOCK: Mr. Lukas, I'm not sure I follow your point that
18 Dr. Wright's not requiring to be paid for posing as an expert, is probative of
19 this credibility. Could you unpack that for me?

20 MR. LUKAS: Yeah, well, I'm sure, as Your Honor knows, you are --
21 preside over many of these proceedings. I would suggest that it is highly
22 unusual for an expert to volunteer his or her time to put in hours and hours
23 of work drafting expert declarations, and to come out and do that free of
24 charge for a party in one of these proceedings or in a district court
25 proceeding. And it's highly unusual, and it goes to his credibility and his, I
26 guess, belief in the statements that he is making and the fact that he stands

1 by his work and does not believe that the results set forth in the '048 Patent
2 would have been in any way predictable to a person of ordinary skill in the
3 art, particularly one with just a undergraduate degree of education.

4 JUDGE POLLOCK: Thank you, Mr. Lukas.

5 MR. LUKAS: You're welcome, Your Honor. And this again goes to
6 his testimony here at slide 93. With organic synthesis remaining a highly
7 unpredictable field. He testified at his deposition about this. And this, so,
8 I'd like to turn now to the calcination temperature range. This is a key point,
9 and it's one of the key unexpected results that the Patent Owner is offering.
10 Wright '451 generally discloses a range for calcination of 200 to 600
11 degrees, or more broadly, 100 to 900 degrees. And Dr. Wright was asked
12 about this and he testified, yeah, okay, there's these ranges disclosed in the
13 Wright '451. And is that an accurate representation, he was asked, of how to
14 calcine, a gamma-alumina catalyst? And he said, you can be at 600 degrees
15 and go for 4 hours and consider that complete calcination. And you just say
16 you'd have to test it. You could use these ranges, but you'd have to test it.
17 And was it proved that you could go below 600, below 550, below 500? No.

18 So, basically the teaching is, and I think where this unexpected result
19 comes in is that a person of ordinary skill in the art, confronted with a range
20 of 200 to 600, would say, well, it should be the same regardless across that
21 entire range. Wright '451 doesn't make any difference between 550 and 600
22 and so over that entire range, you'd expect to see the same thing.

23 And Dr. Taber's testimony on calcination was, well, I asked him,
24 would you need to do that experiment on a new batch of alumina in other
25 words, to ensure that the time and temperature were sufficient to activate it?
26 And he said, yeah, you probably have to do it. You couldn't just read a

1 disclosure and say, this is going to work, you would have to test it. And this,
2 again, goes to the unpredictability in the field.

3 And then he was also asked in his first deposition, well, you're talking
4 about activation versus calcination. And he said, well, calcination is an
5 archaic term; it probably means something, heating to a certain degree of
6 dryness or that sort of thing. He frankly didn't actually really know what
7 calcination was. And so, again, would there be some, he testified, would
8 there be some optimal time and temperature for activation? And yeah, you'd
9 need to do that particular experiment to find out.

10 So, what were the experiments that are disclosed in the '048 Patent?
11 This is set forth, I believe, in example 3, table 2 of the '048 Patent. And
12 what we see here is that calcination of the same catalysts used in both
13 example 1 and 2, calcination of 500 degrees c, gave a lower 1-octene
14 selectivity and a lower conversion to octenes than the calcination at 440. So,
15 Dr. Wright viewed this as a highly unexpected result, primarily because all
16 the prior art and all of his examples that we had looked at previously
17 typically do calcinations at much higher temperatures.

18 And this is also important. So, the question is, well, what is
19 unexpected? What degree of improvement do you need over the prior art to
20 lead to something unexpected? And Dr. Wright's unrebutted testimony is
21 that even a 1 to 2 percent improvement in either conversion or 1-alkene
22 regioselectivity can be a significant benefit from the perspective of reactor
23 design, operating costs, and eliminating a recycling stream. And so, in this
24 instance, I submit, Your Honors, that this result was unexpected, and it
25 should be accorded the finding of a degree in kind over the prior art range or
26 temperature of 500.

1 So, Petitioner's opposition cites in re: Peterson. And I just want to
2 briefly go there, Your Honor, because in re: Peterson is a case where the
3 Patent Owner or the Patent Applicant came up and said, look, we have a
4 claim to 1 to 3 percent. It actually turned out that part of that range actually
5 showed a lower yield and a much lower poorer result over the prior art. And
6 so, what you're seeing here is, I would respectfully submit that in re:
7 Peterson isn't really applicable to this situation at all. And there's no case
8 law other than Geisler (phonetic), which I believe is also not dealing with
9 catalysis. Or conversion, and has no baseline to actually say, well, what is
10 unexpected versus expected. The only testimony of record here is Dr.
11 Wright saying, look, I have industrial experience, a 1 to 2 percent
12 improvement is significant.

13 And then --

14 JUDGE HULSE: Counsel, then, so do you disagree with the general
15 statement of the law then, that your unexpected results have to be
16 commensurate in scope with your claimed range?

17 MR. LUKAS: And I will go there, Your Honor. So, look, we
18 recognize that there's a range of 420 to 480 degrees in the independent
19 claim, substitute claim 29. And we would respectfully submit that if you're
20 going to find that the 420 to 480 range is too broad to be commensurate in
21 scope with the result at 440, then dependent claims 34, 37, 40 and 43 require
22 a much more narrow temperature range of 440 to 460. And we would
23 respectfully submit that these claims are certainly commensurate in scope
24 with the result at 440 degrees.

25 Okay. And I'd also like to briefly address this example 11, table 5. I
26 believe there was a statement from Petitioners saying that there's no

1 evidence that C6 is different from C4 when he was asked a direct question.
2 And I respectfully submit that this example directly contradicts that
3 statement. This is data for hexene, for hexanol to hexene conversion, and it's
4 specifically discussed by Dr. Wright, who notices that, look in Wright '451,
5 for butanol, the optimal conversion was at higher temperatures for butanol.
6 And so, what we're seeing here is that increasing the reactive temperature for
7 hexenes, unlike butanol, actually reduced conversion to hexenes from 1-
8 hexanol. And so, this is unexpected over Wright '451 in particular, given its
9 teaching that conversion should go up with temperature, and that's
10 summarized here on slide 109.

11 Finally, there is testimony in Dr. Wright's last declaration concerning
12 long-felt need and a failure of others. I would like to briefly highlight the
13 fact that Petitioners have filed their own patent application relating to this
14 same technology, and it was filed in 2020, and they are not running at the
15 same conversion, they're not running at the same regioselectivity. If Your
16 Honors choose to look at that document, it's Exhibit 2008. It's discussed in
17 Dr. Wright's second and third declarations. And clearly Petitioners in this
18 case have not been able to achieve the same, or even close to the same
19 significantly improved results over the prior art when it comes to
20 regioselectivity or conversion.

21 And finally, very briefly, I'd like to touch on, unless there's any
22 questions about Wright '451 and unexpected results, I'd like to briefly touch
23 on the written description arguments, Your Honors. And so, the argument
24 from Petitioners is that the reaction temperature may be disclosed, but there's
25 no flow rate. There's only one example with flow rate, so, were not

1 described. How would a person of ordinary skill in the art understand that
2 we were in possession of the invention?

3 Notably, when Petitioners make this argument, they cite to
4 Novozymes v. DuPont. And that case simply is not on all fours with the
5 facts of this case, Your Honors. In Novozymes, you had a Patent Owner
6 claiming an amino acid substitution and a particular peptide sequence with
7 90 percent sequence identity. And then it had a thermostability. Well, there
8 was undisputed evidence in that case that there was no disclosure of even a
9 single variant in any of the examples that showed possession of a peptide
10 that met these claim limitations. That is plainly not the case here. We
11 would submit that not only does example 3 provide a disclosure of the
12 requisite regioselectivity and conversion, Dr. Wright's testimony is that
13 temperature and flow rate are two variables. They're the only process
14 variables that a person of ordinary skill in the art can change to modify the
15 conversion of regioselectivity. So, the fact that you know what temperature
16 a reactor is being run at, a person of ordinary skill would know you could
17 then vary the flow rate to modify the conversion and regioselectivity.
18 Therefore, the disclosure in all the examples of the patent that disclose
19 temperature would demonstrate to a person ordinary skill that there was
20 possession of the claimed processes that result in the required
21 regioselectivity and conversion.

22 Finally, there was example 5, which actually does disclose the flow
23 rate, the temperature, the reactor volume, and the amount of catalyst. And
24 so, a person of ordinary skill in the art would be able to calculate what is
25 called the WHSV. That is the weight hourly space volume of the reactor
26 process. Now, notably, Your Honors, Dr. Taber testified about the prior art.

1 He's testifying about Appleby and Komarewsky in this case, at Exhibit 2005
2 at page 36. And he says, well, there's a lot of variables that aren't mentioned
3 in these prior art articles. So, we don't know the diameter, we don't know
4 the size, we don't know the flow rates, but importantly, we know they're
5 successful. And so, in his earlier testimony, saying, all you need to know to
6 know that somebody was successful and in possession of a process that
7 worked was the actual results. Every one of the examples in the '048 Patent
8 disclose the regioselectivity and the conversion. A person of ordinary skill
9 in the art would know that Inolex was in possession of a process that in fact
10 met these claim limitations.

11 Finally, there's some discussion about WHSV. Dr. Taber actually
12 testified at his first deposition. He had no idea what WHSV was. This is a
13 basic term of art in this heterogeneous catalysis field. He had no idea what it
14 was. I respectfully submit that his testimony on this need to disclose flow
15 rate is frankly not credible and should be rejected.

16 And unless there's any questions, Your Honors, I'll reserve whatever
17 time I have left in sur-rebuttal.

18 JUDGE HULSE: You'll have 15 minutes on surrebuttal.

19 MR. LUKAS: Thank you, Your Honor.

20 JUDGE HULSE: Mr. Murphy, you have 20 minutes.

21 MR. MURPHY: Thank you, Your Honor. I'd like to start by
22 addressing Wright '451 and some of the topics raised by Patent Owner.
23 Initially, I'd like to raise that prior art is presumptively enabled. I believe it
24 was Amgen versus Holquist (phonetic), which stands for the proposition that
25 as long as the longest the disclosure is there, that you're able to, it's
26 presumptively enabled. And then if the Patent Owner would like to show

1 that it's not enabled, then it's their burden to show that there's missing
2 requirements of the prior arts. And on that front, the Patent Owner has been
3 entirely silent. The first time they've raised the idea that this is unenabled
4 would be at this hearing. And so, there can't be any evidence provided
5 there's no Wands analysis, as Counsel mentioned. And so, we would argue
6 that there is no evidence at all that Wright isn't enabled.

7 Further, regarding Dr. Wright himself, we would point the Board to
8 Wright '451, the claims that Dr. Wright originally filed, which should be
9 evidence of what he thought was claimed and important in his invention.
10 And in the claims of Wright '451, they explicitly claim longer chains than
11 just butanol. So, if Dr. Wright is now saying that the claims are not enabled,
12 he previously had filed patent claims directed explicitly towards subject
13 matter that includes more than just butanol. So, the specification of the
14 Wright '451 has multiple disclosures of longer chains. They've not shown
15 that it's not enabled, and they haven't met their burden to show otherwise.

16 We would also raise the fact that Patent Owner is not shown, just to
17 reiterate, Patent Owner has not shown that the entire range of their
18 disclosure is unexpectedly better. There's been no disclosure of that this
19 works better at 420 degrees. There's no, as Patent Owner mentioned, there's
20 differences in their view between octene, and hexene, and decanol. And so,
21 is none at all. We have no examples related to those. And according to
22 Patent Owner, without those examples, a person skilled in the art wouldn't
23 be able to run these examples.

24 So, we think overall that, again, to reiterate, the bulk of the evidence
25 of Wright '451 is that it discloses subject matter that includes octene and
26 hexene, the production of octene and hexene. It happens at the proposed

1 temperature range and it happens at the proposed calcination range. And we
2 don't think that there's any evidence that there is that is absent. Patent
3 Owner also raised this idea of long-felt need and failure of others. Initially,
4 we reiterate the fact that we think these are new arguments.

5 And second of all, we would argue that there's just no nexus between
6 what they've put forward and the result, you know, and the claims
7 themselves. For example, they've argued that Symrise, the Petitioner here,
8 has apparently failed because they filed a different patent application
9 directed at a, you know, a different process. And that's not evidence of
10 failure at all. It's evidence that they've filed a different patent application.
11 And they've also not provided any evidence of any long-felt need that's
12 related to the ranges here. So, we would put forward that those arguments
13 are both new and there's no nexus to the claims themselves, and therefore it
14 should be. It should be discarded.

15 We'd also like to directly address Patent Owners arguments related to
16 112, where I've skipped forward to slide 38 of the demonstratives. Patent
17 Owner cites to the idea that Dr. Taber had given testimony about Appleby
18 and Komarewsky. And what we would like to point out on this front is that
19 Appleby and Komarewsky both actually have flow rates explicitly in their
20 examples. They have, you know, so it's actually of record what they do.
21 Almost every other prior art of record then has flow rates included in there
22 and gives ranges of flow rates where the reactions are able to operate. And
23 what is missing here from Patent Owner is any statement from the
24 specification that points to how a person of skill in the art would understand
25 the flow rate operates, or the person of skill in the art would understand that
26 the inventors possessed flow rates that achieved these results.

1 Again, as we pointed out, the one example that they pointed to is not
2 evidence that it meets the 95 percent regioselectivity, and it's not evidence
3 that there's a proper conversion. The other examples in there just say you
4 change the flow rate. And we would reiterate that the idea that you can
5 change the flow rate, a person of skill in the art knows how to change the
6 flow rate, is fine and we don't disagree with that. But what we don't
7 understand from, again, it's from the disclosure of the '048 Patent, is how
8 does altering the flow rate change those variables? Just saying you could
9 change it doesn't mean that you know what the outcome of those changes
10 are. And because the '048 Patent itself doesn't have any disclosure or
11 information or data that would cabin this in, a person of skill in the art is left
12 guessing about how the '048 Patent itself would operate.

13 And also, kind of the final point on this, I think, is that we would like
14 to clarify that the test for obviousness and the test for written description are
15 going to be two different tests. And so, the fact that there's prior art
16 references that teach elements of this claim within the claimed ranges does
17 not stand for the proposition that the inventors possessed the reactions that
18 are claimed to achieve the results that they claim. And so, we think with
19 those two differences, that, again, Patent Owner's failed to, to meet their
20 burden of showing that there was 112 support for the claims in the '048
21 Patent itself.

22 Then next we'd like to move back to discuss the De Bruyn reference,
23 which is, I'll flip forward to slide 27, where we're discussing De Bruyn at
24 paragraph 37. Patent Owner, again, in the argument, repeatedly referenced
25 replacing the calcium modified catalyst of De Bruyn with the acid catalyst of
26 Takamura, and saying that a person of skill in the art would not undertake

1 this substitution. And again, I think I'll reiterate, because we mentioned this
2 briefly in the opening, is that that's not actually what's being proposed.
3 What's being proposed is that De Bruyn explicitly says that there's multiple
4 processes that are known. These known processes include dehydration in
5 low acidity conditions. And one of those low acidity conditions is using a
6 calcium modified catalyst.

7 And what Takamura says in its preparation is that it's using a metal
8 oxide impregnated into a gamma-alumina catalyst. What De Bruun says is
9 that it has a metal oxide catalyst that's being impregnated into a gamma-
10 alumina structure. So, a person of skill in the art is saying, how would I
11 impregnate this catalyst to make it work in this process? And the person of
12 skill in the art could look to Takamura's description of how that takes place.
13 It also mentions that this is consistent with the prior art of record. As Patent
14 Owner mentioned there are multiple references that discuss how to calcine a
15 catalyst. Dr. Taber, I believe it's in his second declaration, I think it's
16 paragraphs 22-28, walks through Berteau and Takamura, and it's, you know,
17 some of these background references that discuss where calcination takes
18 place. And they're all consistently in this 400 to 550 degree range. And the
19 reason Takamura is applied in this case is because it has more details about
20 how that process is undertaken.

21 And so, we think the motivation is that the catalyst is already
22 disclosed. The process is known. De Bruyn says the process is known.
23 And then a person skilled in the art could look and go, okay, this is a known
24 process, what does it entail? And they can look to the references like
25 Takamura, which explain exactly how that takes place.

1 JUDGE HULSE: Mr. Murphy, can you address Patent Owner's sort
2 of initial overarching statement that this case is all about the credibility of
3 the experts and how Dr. Wright, in his experience, is just more credible than
4 Dr. Taber?

5 MR. MURPHY: Absolutely. Obviously, I would disagree. I think
6 that the evidence of record is that Dr. Taber is a, he is a person of skill in the
7 art. He has been a professor for decades. He has multiple publications in
8 this area. In his declaration and his deposition, he walked through different
9 processes he's undertake that are related. And then for the specifics about
10 which expert is more believable, I think it, in this case, it's actually a
11 detriment that Dr. Wright was personally involved with some of these
12 processes, because he's doing this through the lens of, he's saying, I didn't
13 undertake any of these experiments in Wright '451, I only did butanol. But
14 that's actually not what the test for a person of skill in the art is. Person of
15 skill in the art is what does it teach to that person skill in the art. So, the fact
16 that his personal process is clouding his judgment and clouding his
17 disclosure, I think is a negative.

18 It's also a negative because he hasn't properly addressed, you know,
19 like how these processes are different. He's previously filed claims directed
20 at this exact same subject matter. And now that, you know, a petition has
21 been filed, he's saying that subject matter was totally different, let's look at
22 it; there's only, I'm going to cabin that stuff into this little area where nobody
23 else is doing what my current invention is.

24 And so, he keeps patenting the exact same subject matter over and
25 over again. And then we keep getting new explanations about why his
26 previous invention is different than his current one, even though again, if

1 you, for example, if you look at the claims of Wright '451, they cover this
2 exact same subject matter. And so, I think it's a -- I disagree that it makes it
3 more believable. To me, an independent expert who has no biases
4 associated with the disclosure or the patented claims provides an
5 independent assessment of this. Dr. Wright -- Dr. Taber has been in the,
6 again, he's been a professor, as the Board has found, the person still in the art
7 can replace industrial experience with education. And he has vast amount of
8 that, and he's testified truthfully about all of these things. In that he says,
9 starting in the 1940s, up through the filing of the '048 Patent, these processes
10 were generally known. How they operate is generally understood, and the
11 outcomes are generally known.

12 And to Patent Owner's point that this is very unpredictable, and you
13 wouldn't be able to reach these conclusions, I would disagree with that also.
14 I think that when you look at these, some of the testimony and these
15 examples, I think there's a question of exact specifics. Are you going to get
16 97.5 percent? Are you going to get 98 percent? Like, these differences. But
17 you're able to say, when I operate this catalyst in these ranges, I'm going to
18 achieve greater than 95 percent conversion. Because we've known since,
19 again, since the 1940s, that these alcohol dehydrations tend towards
20 completeness. And we know that these gamma-alumina catalysts are able to
21 achieve fairly high levels of regioselectivity. And then we know that when
22 you add a, you know, alkaline earth metal to the, to the gamma-alumina, that
23 you're passivating the acid sites and you're able to achieve better
24 regioselectivity.

25 So, these are all things that we know. We know from the prior art that
26 these processes are known. We know that when you add a base, you

1 improve regioselectivity. We know different bases are better than other
2 ones. And we know that when we achieve results that are, like Wu had a 96
3 percent regioselectivity, so we know that if we changed a sodium to calcium,
4 that you would expect the regressivity to improve again. And so, I think that
5 when you look at the totality of these circumstances, it's a perfectly -- that
6 Dr. Taber's testimony is both believable and correct.

7 The Patent Owner pointed out a couple, I don't actually know, just
8 some differences of opinion between Dr. Wright and Dr. Taber is not an
9 indication of his believability. And so, I think, all in all, what Dr. Taber's
10 testimony is, is consistent with all the prior art going all the way back, the
11 '40s all the way 'til now. And there's been no effort by Dr. Taber to hedge
12 his testimony to change it every time he files a new patent application, to
13 point out these small differences that are again disclosed in the specification
14 of Wright '451. But now he wants to patent it a second time. So, we're
15 going to say that only the examples matter. And I just think a lot of that
16 ends up being a bridge too far.

17 JUDGE HULSE: Thank you.

18 MR. MURPHY: If there's no further questions, we'd like to conclude
19 on that.

20 JUDGE HULSE: Thank you very much.

21 MR. MURPHY: Thank you.

22 JUDGE HULSE: Mr. Lukas, you have 15 minutes.

23 MR. LUKAS: Very briefly, Your Honors, I would like to respond to
24 Petitioners here in particular on the changing this purported changing his
25 testimony. Dr. Wright has been consistent in his testimony that his own
26 prior art has been the closest prior art. It's nothing like what Dr. Taber has

1 done in terms of changing his testimony from basically showing up at his
2 first deposition not knowing what calcination was, not knowing what weight
3 hour space velocity was, to then in his second declaration saying, well, all
4 these catalysts were calcined a person of ordinary skill when the art would
5 make all these inferences. It's abundantly clear that Dr. Taber had to go
6 back when we submitted our first revised motion to amend and review the
7 prior art and find a bunch of other prior art that he didn't do in his first go
8 around.

9 And I'd just like to briefly touch on estoppel because, because
10 obviously this is an important issue for us. We, in addition to this
11 proceeding, I'm sure Your Honors are aware of the fact that there was
12 another patent from Inolex that was challenged in an IPR. They have
13 alleged that we're now estopped from proceeding to argue for patentability
14 in this case. And again, so looking at the case law, and this is obviousness
15 type double patenting that's cited in Petitioner's opposition. And Lilly v.
16 Board of Regents over the University of Washington comes out and says
17 straight away, look, it's well settled that a narrow species can be non-
18 obviousness, can be non-obvious and patentable over a patent, a broader
19 patent on a genus.

20 Notably, in the '803 Patent that was disclaimed, certain claims were
21 disclaimed, many of those same limitations are at issue in this case. So, the
22 fact that the Inolex disclaimed certain broad claims should have no impact
23 here. And I'd also make light of the fact that the required regioselectivity
24 and conversion from a single pass reaction are essential claim limitations to
25 the substitute claim 29.

1 Finally, when we're talking about substitute claim 29, we readily
2 recognize that this independent claim requires carbon chain of 6 to 10, C6 to
3 C10. But when it comes to the nexus between the unexpected results, the
4 nexus between what's disclosed in the examples and the substitute claims, I
5 would just like to point out for Your Honors that claim 30 is limited to
6 carbon chains of 6 to 8 atoms. Claim 31 is directed specifically to C6, to
7 hexene. Claim 32, and its dependence is directed specifically to C8.

8 And so, we would respectfully submit that if you do not believe that
9 we have requisite data in the '048 Patent examples to support a range of C6
10 to C10, there are explicit examples for C6 and C8 in the '048 Patent. They
11 deal in all instances with showing the requisite conversion and
12 regioselectivity, clearly showing that Inolex was in possession of this, and
13 clearly showing a nexus between the examples and the substitute claims, and
14 more particularly, the dependent substitute claims. So, unless Your Honors
15 have any questions --

16 JUDGE HULSE: I do, real quick.

17 MR. LUKAS: Yeah.

18 JUDGE HULSE: Could you please respond to the fact that the
19 Wright '451 has claims directed to C4 to C6, so it encompasses C6?

20 MR. LUKAS: Yeah, and I will. I mean, look, I can't back away from
21 the fact that it is the law that a patent is disclosed for all that it -- the patent is
22 purported to be disclosed for all that it describes. Now, the question here is
23 not necessarily what Wright '451 describes. It's how a person of ordinary
24 skill in the art would view that. So, yes, it was claiming longer carbon
25 chains. It also, if you look at the dependent claims 2, 3, and 4, gets very
26 narrow very quickly down to particular butanols and pentanols.

1 And so, what I would say is, look Wright '451 was never examined. It
2 was allowed to lapse at the national stage. This is complete speculation to
3 say what would have happened had it gone into examination, had to receive
4 an office action. Certainly, there were claims pending at one point that had
5 longer carbon chains than C4. But I think the important takeaway, Your
6 Honor, is that the testimony of record is that a person of ordinary skill in the
7 art, with a bachelor's degree and two years' experience, wouldn't look to the
8 claims to see for questions of enablement. That person of ordinary skill
9 would look specifically at the examples to find out what did they actually
10 do, how did they do it, and if I wanted to practice what they're doing, that
11 would tell me how to do it. And the examples are specifically limited to bio-
12 1-butanol. They're limited to calcination temperatures of 500 degrees C or
13 greater. And that's what a person of ordinary skill in the art would take
14 away from Wright '451. And I think that's been discussed throughout the
15 record for that piece of prior art.

16 JUDGE HULSE: Great. Well, there are no other questions. Thank
17 you both. Thank you all for your very helpful arguments today. The Panel
18 will take the matter under advisement and we will issue a final written
19 decision in due course, obviously before the statutory deadline. Thank you,
20 all. We are adjourned.

21 MR. LUKAS: Thank you, Your Honor. Have a great afternoon.

22 MR. MURPHY: Thank you, Your Honors.

23 (Whereupon, the proceedings at 2:55 p.m. were concluded.)

IPR2023-01035
Patent 10,995,048 B2

PETITIONER:

James Murphy
Ryan Murphy
Robert Balls
POLSINELLI PC
jpmurphy@polsinelli.com
rmurphy@polsinelli.com
jballs@polsinelli.com

PATENT OWNER:

Aaron Lukas
William Coblentz
COZEN O'CONNOR
alukas@cozen.com
wcoblentz@cozen.com