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Datasheet for the decision of 5 February 2019

Case Number: T 1126/15 - 3.3.10

Application Number: 09155292.7

Publication Number: 2103587

IPC: C07C17/087, C07C17/10, C07C17/20, C07C17/25, C07C17/383, C07C21/18, C01B7/19, C07C19/10, C01B7/03, C01B7/07

Language of the proceedings: EN

Title of invention:
Integrated process to produce 2,3,3,3-tetrafluoropropene

Patent Proprietor:
Honeywell International Inc.

Opponent:
ARKEMA France

Headword:

Relevant legal provisions:
EPC Art. 54(2), 54(3), 83, 123(2), 123(3), 56, 111(1)

Keyword:
Inventive step (no) - main request, auxiliary requests 1 to 7
Patent to be maintained on the basis of auxiliary request 8

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 1126/15 - 3.3.10

D E C I S I O N
of Technical Board of Appeal 3.3.10
of 5 February 2019

Appellant: (Opponent)	ARKEMA France 420 Rue d'Estienne d'Orves 92700 Colombes (FR)
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Respondent: (Patent Proprietor)	Honeywell International Inc. 101 Columbia Road Morristown, NJ 07962 (US)
Representative:	Crooks, Elizabeth Caroline Kilburn & Strode LLP Lacon London 84 Theobalds Road London WC1X 8NL (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 7 April 2015 concerning maintenance of European patent No. 2103587 in amended form.**

Composition of the Board:

Chairman P. Gryczka
Members: R. Pérez Carlón
F. Blumer

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the opposition division concerning the maintenance of European patent No. 2 103 587 on the basis of the main request then pending.

II. Notice of opposition had been filed on the grounds of added subject-matter (Article 100(c) EPC), insufficiency of disclosure (Article 100(b) EPC), and lack of novelty and inventive step (Article 100(a) EPC).

III. The documents filed during the proceedings include the following:

D3: US 2009/0030247 A1
D4: WO 2009/026526 A1
D5: US 2009/0030244 A1
D6: WO 2007/079431 A2
D7: WO 2005/108334 A1
D10: EP 2 151 425 A2
$D10_{bis}$: US 61/087,206

IV. Claim 1 of the main request before the opposition division, which is also the main request of the respondent (patent proprietor) in these appeal proceedings, reads as follows:

"A method for preparing 2,3,3,3-tetrafluoroprop-1-ene comprising:

a) providing a starting composition comprising 1,1,1,2,3-pentachloropropane (HCC-240db);

b) contacting said starting composition with a first

fluorinating agent to produce a first intermediate composition comprising 2-chloro-3,3,3-trifluoropropene and a first chlorine-containing by-product;

c) contacting said first intermediate composition with a second fluorinating agent to produce a second intermediate composition comprising 2-chloro-1,1,1,2-tetrafluoropropane; and

d) dehydrochlorinating at least a portion of said 2-chloro-1,1,1,2-tetrafluoropropane to produce a reaction product comprising 2,3,3,3-tetrafluoroprop-1-ene and a second chlorine-containing by-product."

V. The opposition division concluded that the main request did not contain added subject-matter, and that the claimed invention was sufficiently disclosed for it to be carried out by a person skilled in the art. The right to priority from the earlier priority document was not validly claimed, and for this reason documents D3 to D5 were state of the art within the meaning of Article 54(2) EPC. The claimed method was novel over D3, and document D6 was the closest prior art for the assessment of inventive step. The problem underlying the claimed invention was to provide a method of preparing 2,3,3,3-tetrafluoropropene allowing higher selectivity. The solution, characterised by using HCC-240db as starting material, was not obvious having regard to the prior art.

VI. With the reply to the grounds of appeal, the respondent filed its first to seventh auxiliary requests. The eighth auxiliary request was filed with a letter dated 12 July 2018.

Claim 1 of the first auxiliary request contains all the

features of claim 1 of the main request, with the addition that step d) is carried out catalytically.

Claim 1 of the second auxiliary request contains all the features of claim 1 of the first auxiliary request, and further requires the chlorine-containing by-products of steps b) and d) to be HCl, and the fluorinating agents of steps b) and c) to be HF.

Claim 1 of the third auxiliary request contains all the features of claim 1 of the second auxiliary request and further requires the fluorinating agent of step b) to be anhydrous HF, that step b) is carried out in a first vapour phase reactor and that step d) be carried out in the vapour phase.

Claim 1 of the fourth auxiliary request has all the features of claim 1 of the main request and further requires the chlorine-containing by-products of steps b) and d) to be HCl, the fluorinating agents of steps b) and c) to be HF, and the following reaction paths:

"b) $CCl_3CHClCH_2Cl$ (1,1,1,2,3-pentachloropropane) + + 3 HF → $CF_3CCl=CH_2$ (1233xf) + 4 HCl [...]

c) $CF_3CCl=CH_2$ (1233xf) + HF → $CF_3CFClCH_3$ (244bb)[...]

d) $CF_3CFClCH_3$ (244bb) → $CF_3CF=CH_2$ + HCl (1234yf)"

Claim 1 of the fifth auxiliary request contains all the features of claim 1 of the fourth auxiliary request, with the addition that step d) is carried out catalytically.

Claim 1 of the sixth auxiliary request contains all the features of claim 1 of the fifth auxiliary request and

further requires the fluorinating agent of step b) to be anhydrous HF, that step b) is carried out in a first vapour phase reactor and that step d) be carried out in the vapour phase.

Claim 1 of the eighth auxiliary request contains all the features of claim 1 of the main request and, in addition, requires the following:

"*wherein said first and second fluorinating agents are hydrogen fluoride, said method further comprising the step of separating at least a portion of said hydrogen fluoride from said 2-chloro-3,3,3-trifluoropropene subsequent to, or concurrently with, step (b) and prior to step (c), and the step of separating at least a portion of said hydrogen fluoride from said 2-chloro-1,1,1,2-tetrafluoropropane subsequent to, or concurrently with, step (c) and prior to step (d), wherein said first fluorinating agent comprises at least a portion of said hydrogen fluoride separated from said 2-chloro-3,3,3-trifluoropropene and said second fluorinating agent comprises at least a portion of said hydrogen fluoride separated from said 2-chloro-1,1,1,2-tetrafluorpropane.*"

VII. The arguments of the appellant where relevant for the present decision were as follows:

The claimed invention was not sufficiently disclosed for it to be carried out by a person skilled in the art, since the patent in suit did not disclose any fluorinating agents other than HF or chlorine-containing by-products other than HCl. In addition, example 3 of document D7 showed that it was not possible to obtain 1233xf by treating 240db with HF as required by step b) of claim 1.

Claim 1 of the main request contained added subject-matter, since it resulted from a combination of claims which were not mutually dependent and had no counterpart in the description as originally filed. The description of the patent in suit also contained added subject-matter, as paragraph [0039] of example 1, which corresponded to example 3 as filed, listed all the experimental details of example 1 as filed, which had not been included in the patent as granted. However, example 3 as filed required the same reaction system as example 1, not the same reaction conditions.

The claimed invention could not validly claim the right to the earlier priority date, so that documents D3 to D5 were state of the art as defined in Article 54(2) EPC, and document D10 was state of the art as defined in Article 54(3) EPC.

The method of claim 1 of the main request was not novel over that disclosed in D3, since paragraph [0033] indicated that the process was carried out via preparation of 1233xf.

At the oral proceedings, the appellant considered the multi-step preparation of 1234yf disclosed in document D6 to be the closest prior art. The problem underlying the claimed invention was to obtain an alternative method for preparing 1234yf, and the solution, characterised by obtaining precursor 1233xf by fluorination of 240db, was obvious having regard to D5. This objection applied likewise to the methods of claim 1 of the main request and of the first to seventh auxiliary requests, which were therefore not inventive.

With respect to claim 1 of the eighth auxiliary

request, the claimed solution, characterised by separating HF from each of steps b) and c) and recycling it, was obvious since recycling fell within the standard optimisation in industrial chemistry. For this reason, the claimed method was not inventive.

VIII. The arguments of the respondent, where relevant for the present decision, were as follows:

The appellant's objections under sufficiency of disclosure should be rejected, since the patent in suit provided sufficient information to carry out the invention, and the authors of D7 had stated that its example 3 was erroneous.

Claim 1 of the main request was based on claims 1 and 5 as originally filed, which would be considered combined by the skilled reader, despite the lack of mutual dependence. No subject-matter had been added by the amendment of paragraph [0039] of the patent in suit, which merely incorporated the conditions under which example 1 of the patent in suit had been carried out.

The right to the earlier priority date of the patent in suit had been validly claimed, as the skilled reader would recognise that the feature indicated at the end of step c) of the priority documents was erroneously placed there and should be part of step d), instead.

In any event, document D10 was not state of the art for the claimed invention, as it could not claim its earliest priority date from D10bis.

The method of claim 1 of the main request was novel, as D3 did not clearly and unambiguously disclose steps b) and c) required by claim 1.

At the oral proceedings, the respondent considered either D3 or the one-step preparation of 1234yf disclosed in document D6 to be the closest prior art. If the multi-step process disclosed in D6 were, nevertheless, considered closer, the problem underlying the claimed invention was to provide an alternative method for preparing 1234yf. The state of the art did not provide a pointer to the claimed solution, characterised by obtaining precursor 1233xf by fluorination of 240db, which was therefore not inventive. The respondent did not dispute that the conclusion on inventive step would be the same for the main request and for the first to seventh auxiliary requests, which in fact were mostly intended to overcome other objections of the appellant.

With respect to the method of claim 1 of the eighth auxiliary request, the problem underlying the claimed invention was to provide a method whereby raw material utilisation and product yields could be increased. The claimed solution was characterised by separating HF from each of steps b) and c) and recycling it. The prior art disclosed scrubbing after each of these steps, which rendered any unreacted HF unsuitable for recycling. There was thus no pointer to the claimed solution which was therefore inventive.

IX. Oral proceedings before the board of appeal took place on 5 February 2019.

X. The final requests of the parties were as follows:

- The appellant requested that the decision under appeal be set aside and that the European patent No. 2 103 587 be revoked.

- The respondent requested that the appeal be dismissed, or subsidiarily, that the patent be maintained in the form of one of the first to eighth auxiliary requests,
  - the first to sixth auxiliary request as filed with the response to the grounds of appeal dated 2 December 2015,
  - the seventh auxiliary request being to delete claims 6 and 7 from any of the requests on file (requested in the response to the grounds of appeal dated 2 December 2015),
  - the eighth auxiliary request as filed with a letter dated 12 July 2018.

XI. At the end of the oral proceedings, the decision was announced.

Reasons for the Decision

1. The appeal is admissible.

Sufficiency of disclosure, all requests.

2. Claim 1 of the main request relates to a method for preparing 2,3,3,3-tetrafluoropropene (1234yf) by fluorinating 1,1,1,2,3-pentachloropropane (240db) to obtain 2-chloro-3,3,3-trifluoropropene (1233xf) with a first fluorinating agent, which is further fluorinated with a second fluorinating agent to 2-chloro-1,1,1,2-tetrafluoropropane (244bb). In a last step, 244bb is dehydrochlorinated to produce 1234yf. Chlorine-containing by-products are produced in the first fluorination reaction and in the last step (see claim 1).

3. The appellant argued that the claimed invention could not be put into practice over the whole scope of the claim, as the patent in suit did not disclose any fluorinating agents other than HF or chlorine-containing by-products other than HCl, which were nevertheless contemplated within the claimed method.

However, the patent in suit discloses in the examples at least one way to carry out the invention. Even if, as argued by the appellant, the skilled reader would not contemplate any fluorinating agent other than HF, they would nevertheless get the information from the patent in suit that HF is a fluorinating agent which will allow them to put the claimed process into practice. The board thus fails to see why such a situation would have any bearing on the sufficiency of the patent's disclosure.

4. In a second line of argument, the appellant argued that example 3 of document D7 showed that it was not possible to obtain 1233xf by treating 240db with HF as required by step b) of claim 1. This evidence shifted the burden of proof to the respondent to show that the claimed invention could be carried out. The appellant could not reproduce the examples of the patent in suit since it lacked necessary details such as the provider and commercial name of the catalyst used.

Example 1 of the patent in suit provides information on how to carry out step b) of claim 1. There is no experimental evidence that the examples of the patent specification could not be reproduced.

The respondent in these appeal proceedings was also the applicant that filed European application D7 and has indicated to the examining division dealing with that

case that its example 3 was erroneous, and the board sees no reason to question that statement having regard to the available evidence.

In any event, the catalyst used in example 3 of D7 is chromia, not pretreated chromia, which could have led to a different result. The results of D7, if they were correct, and those of the claimed invention are thus not incompatible.

There is thus no conclusive evidence which could prove that step b) of claim 1 could not be carried out following the examples of the patent in suit. This argument is thus rejected.

5. For these reasons, the appellant failed to convince the board that the claimed invention was not sufficiently disclosed for it to be carried out by a person skilled in the art.

6. It was common ground that the conclusion on the issue of sufficiency of disclosure applied *mutatis mutandis* to the method of claim 1 of all the auxiliary requests.

Right to the priority date of 20 March 2008, all requests

7. The patent in suit claims priority date from two earlier applications.

In the following, it will be examined whether the claimed invention validly claims the right to the priority date of 20 March 2008 from the earlier of these two applications, namely US 61/038,327 (P1).

Whether or not priority can be validly claimed from the second of these applications has no bearing for the

outcome of these proceedings and thus does not need to be decided.

8. The method of claim 1 of the main request differs from that of claim 1 of P1 in that, *inter alia*, the latter requires the formation of a second chorine-containing by-product as the result of step c), which is not required by step c) of the main request.

9. The respondent argued that it was obvious that an error had occurred. Step c) of the claimed invention was a hydrofluorination step, which did not involve HCl formation. In contrast, step d) was a dehydrochlorination step in which HCl was inevitably formed. The skilled reader, confronted with claim 1 of P1 and taking into consideration the known reaction paths disclosed on page 5, steps 2 and 3, would recognise that the feature "and a second chlorine-containing by-product" belonged in fact to step d) and not to step c) of P1.

10. The board is not convinced, however, by this argument. Example 2 of the patent in suit discloses a process corresponding to step c) of claim 1 of the main request in which 245cb (CF_3-CH_2-CF_2H) and 1223xd (CF_3-CHCl-CH_2Cl) are also obtained as by-products. The latter is a chlorinated by-product in itself, while the former could have led to HCl production; thus both are compatible with step c) of P1. Be that as it may, the skilled reader would not necessarily have arrived at the conclusion that there is an error in P1, let alone that said error could only have been corrected in such a way as to correspond to the method of claim 1 of the main request.

11. For this reason alone, the board concludes that the claimed invention cannot validly claim the right to its earlier priority date.

12. It was not in dispute that the conclusion on the right to priority due to the absence of a chlorine-containing by-product as a result of step c) of claim 1 is not altered by any of the auxiliary requests on file.

It is thus concluded that none of the requests on file validly claim the earlier priority date of 20 March 2008.

State of the art

13. Documents D3 to D5

Due to the conclusion on the right to priority of the claimed invention, documents D3 to D5 are prior art as defined in Article 54(2) EPC.

14. Document D10

14.1 Document D10 was filed and published after the filing of the patent in suit. D10 will be state of the art as defined in Article 54(3) EPC if it validly claimed the right to priority from its earliest priority document D10bis.

14.2 Document D10 relates to a process for the production of 1234yf from 240db [0007], [0008], according to which 244bb is obtained from 1233xf in the presence of HCl [0007], which is "added into the reaction from an external source at a pressure of about 100 psig or more" (paragraph [0009], independent claims 1, 9 and 15).

In contrast, document D10bis does not require this specific HCl addition, nor can it be derived, directly and unambiguously, from D10bis as a whole. For this reason alone, D10bis does not relate to the same invention as D10, which consequently does not validly claim the right to its earliest priority date.

Document D10 is thus not prior art for the claimed invention.

Novelty over D3, all requests

15. Example 4 of D3 discloses the vapour-phase continuous conversion of 2-chloro-1,1,1,2-tetrafluoropropane 244bb to 2,3,3,3-tetrafluoropropene 1234yf. This process corresponds to step d) of claim 1 of the main request.

Paragraphs [0014] and [0024] of D3 disclose the preparation of 244bb from a chlorinated compound such as 240db. This reaction corresponds to the combination of steps b) and c) of claim 1 and is followed by dehydrochlorination to produce 1234yf (step d). This is not in dispute.

16. The appellant argued that 3,3,3-trifluoro-2-chloropropene (1233xf) was expected as a by-product of the process of D3 [0033] and thus that steps b) and c) of claim 1 were implicitly disclosed in D3.

However, paragraph [0033] is to be read in combination with its preceding paragraph, which relates to the obtention of 2-chloro-1,1,1,2-tetrafluoropropane 244bb from a different starting material.

The appellant further argued that paragraph [0033]

referred to "the reaction" in general and thus related to intermediates involved in each of the steps leading to 244bb and not only to the reaction disclosed in its preceding paragraph [0032].

However, even if, for argument's sake, paragraph [0033] referred to every reaction disclosed in D3, the skilled reader would not consider the intermediates disclosed in paragraph [0033] to be obtainable, regardless of which starting material listed on paragraph [0014] was used in the process. This argument is thus not convincing.

17. It is thus concluded that D3 fails to clearly and unambiguously disclose the process of claim 1 of the main request, which is, for this reason, novel.

It was not in dispute that this conclusion also applied *mutatis mutandis* to the method of claim 1 of all the auxiliary requests on file.

Inventive step, main request and auxiliary requests 1 to 7

18. Claim 1 of the main request relates to a method for preparing 1234yf by fluorinating 240db to obtain 1233xf (step b), which is fluorinated to 244bb (step c). In a last step, 244bb is dehydrochlorinated to produce 1234yf (step d).

19. Closest prior art

At the oral proceedings before the board, the appellant considered the multi-step synthesis of 1234yf in document D6 to be the closest prior art, in line with the opposition division's decision.

The respondent argued that document D3 came closer to the claimed invention. If D6 were nevertheless to be regarded as the closest prior art, the embodiment of D6 according to which 1234yf was obtained from 240db in a single-step process (page 3, line 28, in combination with formulas (IB) and (II) in lines 12 and 14) was closer to the claimed invention than the multi-step synthesis in the same document.

Both D3 and D6 relate, like the claimed invention, to the synthesis of 1234yf and are thus suitable starting points for examining inventive step.

The question of whether D3 or the one-step embodiment of D6 comes closer to the claimed invention than the multi-step process of D6 can, however, be left aside, since the board holds that, even starting from the allegedly remoter multi-step embodiment of D6, the proposed solution is obvious for the reasons explained below. It is thus not necessary to decide whether other embodiments would come even closer to the claimed invention.

It was common ground that document D6 discloses steps c) and d) of claim 1 of the main request and that these steps are preceded by the fluorination of a starting material which is preferably a tetrachloropropene (page 2, line 28), such as 1,1,2,3-tetrachloropropene (example 4) or 2,3,3,3-tetrachloropropene (example 8).

20. Technical problem underlying the invention

At the oral proceedings before the board, the respondent no longer relied on its arguments in point 7.3 of its reply to the grounds of appeal that the problem underlying the claimed invention was the

provision of a method having various advantages over those of the prior art.

It was therefore not in dispute that the technical problem underlying the claimed invention was to be seen in providing an alternative method for the preparation of 1234yf. The board sees no reason to differ.

21. Solution

The solution to this technical problem is the claimed method, characterised in that precursor 1233xf is obtained by dehydrofluorination of 240db.

22. Success

The board agrees with the parties that, having regard to the data provided in the examples of the patent in suit, the problem formulated in point 20. is credibly solved by the method of claim 1.

23. It thus remains to be decided whether or not the proposed solution to the objective problem defined above is obvious from the prior art.

23.1 The skilled person, trying to obtain an alternative method for preparing 1234yf, would turn to a document such as D5. Like the closest prior art D6, D5 also relates to the production of 1234yf [0008], in particular the preparation of intermediate 1233xf by hydrofluorination [0011].

According to D5, 1233xf can be obtained by hydrofluorination of three starting materials, namely those disclosed in D6 (1,1,2,3-tetrachloropropene, 2,3,3,3-tetrachloropropene) and 240db [0011]. Thus, D5

discloses 240db as a suitable alternative to the starting materials of D6 in the context of the same process. The skilled person would have combined the teaching of these two documents and thus arrived at the claimed invention without the need for inventive skills.

23.2 The respondent argued that the skilled person would have combined the teachings of D6 and D5 only with knowledge of the invention.

However, the board fails to see why the combination of two documents relating to the preparation of the same compound as the patent in suit in order to provide an alternative is an *ex-post facto* analysis of inventive step.

23.3 The respondent further argued that the teaching of D5 was incompatible with that of D6. 240db was mentioned in D6 in the context of a one-step process for producing 1234yf (page 3, line 28). Thus, even if the skilled person were to have considered 240db to be suitable starting material, it would have been for a one-step process and not for the method of the claimed invention.

However, if document D6 had disclosed 240db as a suitable starting material in the context of the multi-step process, the issue for discussion might be novelty and not inventive step. It is not D6 that teaches the claimed solution, but D5 for the reasons explained above. This argument is thus not convincing.

23.4 The respondent argued that document D5 disclosed tetrachloropropenes as the most preferred starting compounds. For that reason, even if the skilled person

had considered that document, they would not have arrived at the claimed invention.

However, this argument cannot be accepted. It is correct that the examples of D5 are carried out with tetrachloropropene derivatives as starting materials. However, this does not rule out that D5 teaches 240db as an alternative to these compounds.

23.5 The board thus concludes that the method of claim 1 of the main request is not inventive, as required by Article 56 EPC.

The conclusion with regard to inventive step of the method of claim 1 of the main request applies *mutatis mutandis* to claim 1 of the first to seventh auxiliary requests. This was not in dispute.

Eighth auxiliary request

24. Amendments

24.1 Claim 1 of the eighth auxiliary request results from the combination of claims 1, 5, 9 and 10 as originally filed.

24.2 In the context of claim 1 of the main request, the appellant argued that claims 1 and 5 as originally filed could not be combined, despite the latter being dependent on the former. Although claim 1 as originally filed required one compound of one of general formulas (I) to (III), it did not necessarily require these compounds to be converted into 1233xf in step b) but merely required that they should be present.

However, the content of the application as originally

filed should be read with a mind willing to understand, disregarding unreasonable interpretations. In the context of the multi-step chemical process of claim 1, the mention of a compound as part of a "starting composition" indicates its role as reagent. This is consistent with the disclosure in the description. Further, the skilled person would expect these compounds to be reactive under fluorination conditions.

The board thus sees no reason to interpret claim 1 as relating to embodiments in which compounds of formula (I) to (III) are required as mere inert components in the process.

24.3 The appellant further argued that claims 9 and 10 as originally filed were not combined with claim 5 and did not provide the required basis for claim 1 of the eighth auxiliary request.

However, the mere lack of mutual dependency of claims is not sufficient to deny a basis for an amendment based on their combination. The question is whether the skilled person would have derived such combination, directly and unambiguously, from the application as a whole. The application as originally filed related to hydrofluorination with HF and separating and recycling this compound (see examples 3 to 6, the figures; page 5, line 25; page 9, line 31 to page 10, line 3; page 10, lines 12-17) and did not disclose any alternative to this embodiment. The skilled reader would thus consider the features of claim 5 and those of claims 9 and 10 to be combined, even in the absence of mutual dependency.

This argument of the appellant is thus not convincing.

24.4 Dependent claims 2 to 5 find a basis in claims 2 and 6 to 8. Claim 6 results from the combination of claims 6 to 8 as filed. Despite not being mutually dependent, the skilled reader is not presented with any alternative to carrying out steps b) and d) in vapour phase over a catalyst and step c) as a catalytic liquid phase fluorination, and would thus consider these features to be combined. Lastly, dependent claim 7 finds a basis on page 9, lines 15 to 25, and in the overall disclosure of the application as filed.

The requirements of Article 123(2) EPC are thus fulfilled.

24.5 Claim 1 results from the combination of granted claims 1, 6 and 7. The requirements of Article 123(3) EPC are thus fulfilled. This was not in dispute.

25. Sufficiency of disclosure and novelty

For the reasons given with respect to the main request above (points 2. to 17.), the claimed invention is sufficiently disclosed and the method of claim 1 novel.

26. Inventive step

26.1 Claim 1 of the eighth auxiliary request relates to a method for preparing 1234yf by fluorinating 240db with HF to obtain 1233xf (step b), which is fluorinated with HF to 244bb (step c). During or after each of steps b) and c), a portion of said HF is separated and brought back into the step in question. In a last step, 244bb is dehydrochlorinated to produce 1234yf (step d).

26.2 Closest prior art

In favour of the appellant, the board accepts its argument that document D6 is the closest prior art.

D6 discloses the synthesis of 1234yf in a multi-step process which includes steps c) and d) of claim 1 of the eighth auxiliary request, preceded by the fluorination of a starting material which is not 240db. D6 does not disclose any separation of HF followed by recycling said compound back into the reaction.

26.3 Technical problem underlying the invention

The respondent considered that the technical problem underlying the claimed invention was to provide a method whereby raw material utilisation and product yields could be increased (paragraph [0008] of the patent in suit).

26.4 Solution

The solution to this technical problem is the claimed method, characterised in that intermediate compound 1233xf is obtained by dehydrofluorination of 240db, and in that HF is separated from each of steps b) and c) and recycled.

26.5 Success

It was not in dispute that the problem formulated above has been credibly solved.

26.6 It thus remains to be decided whether or not the proposed solution to the objective problem defined above is obvious from the prior art.

26.6.1 The appellant argued that separating and recycling any unused reactant fell within the skills of the person skilled in the art and could not serve as the basis for an inventive activity.

However, the state of the art, as opposed to the patent in suit, only discloses hydrofluorination steps followed by scrubbing any excess of HF over a base (examples 6 and 7 of D6; paragraph [0042] of D3) or water (examples of D5) and subsequent separation of the exit gases. Thus, the state of the art discloses that HF has to be removed from the reaction gases using techniques which render it unsuitable to be recycled back into the hydrofluorination reaction. The skilled person would thus find no pointer to the claimed solution in the prior art.

26.7 The board thus concludes that the method of claim 1 of the eighth auxiliary request is inventive, as required by Article 56 EPC.

27. Remittal and amendment of the description

27.1 The description of the patent as granted contains subject-matter which is not encompassed by the claims of the eighth auxiliary request (see for example [0023]) and thus requires amendment (Article 84 EPC). The board decided to make use of its discretion to remit the case to the opposition division for adaptation of the description, including the drawings (Article 111(1) EPC).

27.2 Example 1 of the patent in suit corresponds to example 3 as originally filed, which was carried out in "the same vapor phase fluorination reaction system as described in example 1" (page 22, lines 21-22 of the

application as originally filed).

Example 1 as filed, which related to an embodiment not according to the claimed invention, was deleted during examination. Example 3 was amended to require the same conditions as example 1 as filed [0039].

This amendment goes beyond the original disclosure, since example 3 as filed required "the same reaction system" as example 1 and not exactly the same experimental conditions (catalyst amount, reaction temperature, just to name a few) as are now included in paragraph [0039].

27.3 The respondent argued that all that information from example 1 was required in order to provide a comparison.

However, examples 1 and 3 were according to the claimed method as originally filed and were not intended for comparison. This argument of the respondent is thus not convincing.

27.4 The parties agreed on this deficiency being dealt with when filing a description adapted to the eighth auxiliary request before the opposition division, after remittal.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the

claims of the eighth auxiliary request as filed with letter dated 12 July 2018 and a description yet to be adapted.

The Registrar: The Chairman:

C. Rodríguez Rodríguez P. Gryczka

Decision electronically authenticated