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DECISION
of 25 January 2001

Case Number: T 0567/95 - 3.3.1

Application Number: 88119492.2

Publication Number: 0317981

IPC: C07C 22/00

Language of the proceedings: EN

Title of invention:
Process for producing 1,1-dichloro-1,2,2,2-tetrafluoroethane

Patentee:
ASAHI GLASS COMPANY LTD.

Opponent:
Solvay Deutschland GmbH Patentabteilung
E.I. Du Pont de Nemours & Company, Inc.

Headword:
Dichloro tetrafluoro ethane/ASAI GLASS

Relevant legal provisions:
EPC Art. 56, 83, 84, 123(2),(3)

Keyword:
"Extension beyond the content of the application as filed (no)"
"Amendments extending the protection conferred by the patent as granted (no)"
"Clarity of the claims (yes)"
"Support of the claims by the description (yes)"
"Sufficiency of disclosure (yes)"
"Inventive step (yes, after amendment) - non-obvious solution of the technical problem underlying the patent in suit - could/would approach"

Decisions cited:
-

Catchword:
-

Case Number: T 0567/95 - 3.3.1

DECISION
of the Technical Board of Appeal 3.3.1
of 25 January 2001

Appellant: (Proprietor of the patent)	ASAHI GLASS COMPANY LTD. No. 1-2, Marunouchi 2-chome Chiyoda-ku Tokyo (JP)
Representative:	Wächtershäuser, Günter, Prof. Dr. Patentanwalt Tal 29 D-80331 München (DE)
Respondent 1: (Opponent 01)	Solvay Deutschland GmbH Patentabteilung Postfach 220 D-30002 Hanover (DE)
Representative:	Lauer, Dieter, Dr. Solvay Pharmaceuticals GmbH Hans-Böckler-Allee 20 D-30173 Hannover (DE)
Respondent 2: (Opponent 02)	E. I. Du Pont De Nemours and Company 1007 Market Street Wilmington Delaware 19898 (US)
Representative:	Woodcraft, David Charles BROOKES & MARTIN High Holborn House 52/54 High Holborn London, WC1V 6SE (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted 11 May 1995 revoking European patent No. 0 317 981 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: A. J. Nuss
Members: J. M. Jonk
J. P. B. Seitz

Summary of Facts and Submissions

I. The Appellant (Patentee) lodged an appeal against the decision of the Opposition Division by which the European patent No. 0 317 981 (European patent application No. 88 119 492.2) was revoked.

II. Claim 1 of the patent in suit read as follows:

"A process for producing 1,1-dichloro-1,2,2,2-tetrafluoroethane, which comprises isomerizing 1,1,2-trichloro-1,2,2-trifluoroethane in the presence of an isomerization catalyst comprising a halide or oxide of at least one element selected from the group consisting of Al, Cr, Mg, Ca, Sr, Ba, Fe, Ni and Co, to form 1,1,1-trichloro-2,2,2-trifluoroethane, followed by fluorination with hydrofluoric acid in the presence of a fluorination catalyst comprising a halide or oxide of at least one element selected from the group consisting of Al, Cr, Mg, Ca, Sr, Ba, Fe, Ni, Co, Sb, Nb, Mn and Ta."

II. The decision under appeal was based on a main request and an auxiliary request filed during the oral proceedings before the Opposition Division on 26 April 1996.

III. The opposition was supported by several documents including:

(1) GB-A-921 796,

(2) Journal of Fluorine Chemistry, Vecchio et al, 4 (1974), 117-139,

(3) Z. anorg. allg. Chem., Kolditz et al, 434 (1977), 41-54,

(5) Z. anorg. allg. Chem., Kolditz et al, 434 (1977), 55-62,

(6) Z. anorg. allg. Chem., Kolditz et al, 476 (1981), 23-32,

(8) Journal of Fluorine Chemistry, Kolditz et al, 5 (1975), 141-151, and

(12) DE-B-1 668 346.

IV. The Opposition Division held that the subject-matter of the claims of the main request and of the auxiliary request then on file was novel, but did not involve an inventive step.

Concerning inventive step, it held in particular that the technical problem underlying the patent in suit in the light of document (1) (GB-A-921 796) as the closest state of the art was the provision of an alternative process for producing the desired compound R-114a, and that the claimed solution of this problem was obvious to the skilled person in view of the teaching of document (1) in combination with documents (2), (5) and (12).

V. Oral proceedings were held before the Board on 25 January 2001 in the absence of the Appellant (Patentee). He informed the Board of Appeal with a letter dated 25 July 2000, that he would not attend the oral proceedings.

VI. The Appellant defended the patentability of the process of the patent in suit on the basis of a Claim 1 filed with letter dated 18 August 1997 reading as follows:

"A process for producing 1,1-dichloro-1,2,2,2-tetrafluoroethane, which comprises isomerizing 1,1,2-trichloro-1,2,2-trifluoroethane in the gas phase in the presence of an isomerization catalyst comprising a halide or oxide of at least one element selected from the group consisting of Al and Cr, whereby the isomerization rate of 1,1,2-trichloro-1,2,2-trifluoroethane is higher than the disproportionation rate to 1,1,1,2-tetrachloro-2,2-difluoroethane and 1,1-dichloro-1,2,2,2-tetrafluoroethane, to form a mixture comprising 1,1,1-trichloro-2,2,2-trifluoroethane, 1,1,1,2-tetrachloro-2,2-difluoroethane and 1,1-dichloro-1,2,2,2-tetrafluoroethane which mixture is subsequently transferred into a reactor as it is for fluorination with hydrofluoric acid in the presence of a fluorination catalyst comprising a halide or oxide of Cr."

This claim differed essentially from the Claim 1 of the auxiliary request refused by the Opposition Division by indicating that the isomerisation step is carried out in the gas phase, by the use of the now defined isomerisation catalyst and the now defined fluorination catalyst, and by indicating that the reaction mixture as formed in the isomerisation step is transferred into a reactor "as it is" for fluorination.

The Appellant disputed that the claimed subject-matter would be obvious to the skilled person in the light of the cited documents. In this context, he argued in particular that, starting from document (1) as the closest prior art, it would not have been obvious to the skilled person in the light of the cited documents to achieve an improved process for preparing the compound 1,1-dichloro-1,2,2,2-tetrafluoroethane **(R-114a)** having a high purity by using as a first reaction step a predominant isomerisation of the compound 1,1,2-trichloro-1,2,2-trifluoroethane **(R-113)** to 1,1,1-trichloro-2,2,2-trifluoroethane **(R-113a)** and as a second reaction step a fluorination of the so obtained reaction mixture in the presence of a Cr comprising catalyst. In this context, he emphasized that for the question of inventive step it was not decisive that the avoidance of disproportionation was known per se in a process aiming at R-113a as end product, but rather whether the skilled person would have expected that by said avoidance of disproportionation an improved process for preparing R-114a could be achieved.

VII. The Respondents (Opponents 1 and 2) argued that the subject-matter of present Claim 1 did not meet the requirements of Article 123(2) EPC, since it extended beyond the content of the application as filed in view of

- the now claimed catalysts,

- the performance of the isomerisation step in the gas phase in combination with a fluorination step in the liquid phase or in the gas phase,

- the forming of a reaction mixture resulting from the isomerisation step comprising R-113a, R-114a and 1,1,1,2-tetrachloro-2,2-difluoroethane **(R-112a)**, and

- the transfer of the reaction mixture resulting from the isomerisation step as it is to the fluorination reactor.

Moreover, Respondent 2 (Opponent 2) contended that according to present Claim 1 the fluorination step was not a mandatory feature, so that present Claim 1 also did not meet the requirements of Article 123(3) EPC.

Furthermore, the Respondents argued that present Claim 1 was not clearly formulated and properly supported as required under Article 84 EPC, since in the light of the description of the patent in suit, in particular Example 17, the wording of the claim did not exclude any treatment or modification of the reaction mixture as obtained from the isomerisation step before its transfer to the fluorination reactor.

The Respondents also argued that in view of the functional feature in present Claim 1 indicating that the isomerisation step has to be carried out in such a way that the isomerisation rate of R-113 is higher than the disproportionation rate to R-112a and R-114a, the subject-matter of present Claim 1 did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art as required under Article 83 EPC. However, they did not dispute the correctness of the examples in the patent in suit and the Examples 7a and 8a filed by the Appellant with letter dated 21 September 1995.

Both Respondents also maintained their point of view that the subject-matter of present Claim 1 lacked inventive step in view of document (1) in combination with documents (2), (3), (5), (6), (8) and (12). In this context, they argued in particular:

- that the process of present Claim 1 did not comprise any advantage concerning yield and purity of the desired R-114a product;

- that the process of present Claim 1 only differed from the process of the closest prior art as disclosed in document (1) in that the process of Claim 1 did not comprise a distillation step between the isomerisation step and the fluorination step, and in that according to the claimed process the fluorination step was carried out in the presence of a Cr comprising catalyst;

- that the preparation of R-114a by isomerising the compound R-113 and fluorination of the so obtained isomerisation product R-113a was known *per se* from Figure 3 in document (2);

- that it would have been obvious to the skilled person to omit the distillation step between the isomerisation step and the fluorination step in the process of document (1) in view of the facts:

    (i) that according to document (1) by isomerising R-113 a crude product was obtained, which contained R-114 (usually more than 90% R-114a) and R-113 (usually more than 90% R-113a) as the major products,

    (ii) that it was indicated in document (1) that the asymmetrical compound R-113a fluorinated much more readily than the symmetrical R-113 permitting the recycling of this compound to the isomerisation step,

(iii) that it was known from documents (1), (3) and (12) that by selecting proper conditions, which were well known to the skilled person as follows, for example, from documents (1) and (3), the isomerisation reaction could be caused to predominate over the disproportionation reaction, and

(iv) that it was also known from document (1) that, as the fluorination proceeds from the lower to the more highly fluorinated products, more and more drastic conditions to introduce additional fluorine had to be applied, so that the skilled person would have expected that under proper mild conditions the compound R-114a obtained in the isomerisation step would not be further fluorinated in the following fluorination step; and

- that it followed from documents (2), (5), (6) and (8) that Cr comprising catalysts were suitable fluorination catalysts.

VIII. The Appellant requested in writing that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of Claim 1 filed with letter dated 18 August 1997 and Claims 2 and 3 filed with letter dated 21 September 1995.

The Respondents requested that the appeal be dismissed.

IX. At the conclusion of the oral proceedings the Board’s decision was pronounced.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments under Article 123(2) and (3) EPC*

2.1 The subject-matter of present Claim 1 is supported by the **application as filed** as follows:

(a) by Claim 1;

(b) by Claim 2; page 3, line 25 to page 4, line 2; and page 4, lines 13 to 17; representing support for the use of the now claimed isomerisation catalysts;

(c) by Claim 3; page 4, lines 3 to 9; page 4, lines 13 to 17; the examples for preparing the catalysts, and the Examples 1 to 10, 13 and 14; supporting the use of the now defined fluorination catalysts;

(d) by Claim 4 and page 4, lines 18 to 22 supporting the feature that the isomerisation step as such can be carried out in the gas phase;

(e) by page 3, lines 5 to 9, supporting the feature that in the isomerisation step the isomerisation rate from R-113 to R-113a is higher than the disproportionation rate to R-112a and R-114a, and, therefore, implicitly the forming of R-112a and R-114a,

(f) by Claim 1; page 3, lines 10 to 13; and the Examples 1 to 10, 13 and 14; supporting the feature that the isomerisation step is followed by the fluorination step to provide the desired product (R-114a), and that thereby the reaction mixture from the isomerisation step as it is, thus the unmodified reaction mixture, is transferred into the fluorination reactor.

2.2 The subject-matter of present Claims 2 and 3 is supported by the originally filed Claims 4 and 5, respectively.

2.3 Therefore, the amended subject-matter of present Claims 1 to 3 does not contravene Article 123(2) EPC, which only requires that no subject-matter extending beyond the content of the application as filed is added to a European patent or patent application.

2.4 Furthermore, since the process of Claim 1 as granted is restricted to the use of an isomerisation step carried out in the gas phase, the application of particular catalysts in the isomerisation step and in the fluorination step, and the performance of the isomerisation step in such a way that the isomerisation rate of R-113 is higher than the disproportionation rate to R-112a and R-114a, it is the Board's position that the subject-matter of present Claim 1 does not contravene Article 123(3) EPC either.

2.5 In this context, the Respondent 2 contended that according to the wording of present Claim 1 the performance of a fluorination of the isomerisation product would not be a mandatory feature anymore, and that therefore the scope of protection conferred by

Claim 1 as granted would have been extended. However, the Board cannot accept this contention, since the skilled person reading present Claim 1 relating to the preparation of R-114a and indicating that the mixture formed in the isomerisation step (i.e. a mixture comprising R-113a as the major product) is subsequently transferred into a reactor as it is for fluorination, would directly and unambiguously conclude that for producing the desired product, i.e. R-114a, the fluorination step must necessarily follow as an essential feature of the claimed process.

3. *Support and clarity under Article 84 EPC*

3.1 In this respect, the Respondents argued that present Claim 1 was neither clearly formulated nor properly supported as required under Article 84 EPC, since in the light of the description of the patent in suit, in particular Example 17, the "transfer of the reaction mixture resulting from the isomerisation step as it is" as stated in present Claim 1 did not unambiguously mean that said mixture had to be transferred to the fluorination reactor excluding any modification of its contents.

3.2 However, in the Board's judgment, present Claim 1 indicating that the reaction mixture from the isomerisation step is transferred into the fluorination reactor as it is for fluorination, is unambiguously restricted to that embodiment of the process according to the patent in suit as supported by the Examples 1 to 10, 13 and 14 of the patent in suit, in which said reaction mixture as such, i.e. without any modification, is fluorinated in order to achieve the desired R-114a.

3.3 It is true, that the description of the patent in suit in its present form still comprises Example 17, which relates to another embodiment of the present process in which the reaction mixture obtained from the isomerisation step, after cooling, was subjected to filtration before performing the fluorination reaction (see page 7, lines 23 and 27), and that this example is inconsistent with present Claim 1. Therefore, in the Board's judgment, the Appellant who amended his claim by introducing said feature has also to bring the description into line with the amended claim in order to meet the requirements of Article 84 EPC (see also point 6.15 below).

4. *Sufficiency under Article 83 EPC*

4.1 The Respondents argued with respect to this issue that in view of the functional feature in present Claim 1 indicating that the isomerisation step has to be carried out in such a way that the isomerisation rate of R-113 is higher than the disproportionation rate to R-112a and R-114a, the subject-matter of present Claim 1 did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by person skilled in the art as required under Article 83 EPC.

4.2 However, such an objection is inconsistent with the fact that in the context of the discussion of inventive step (see point 6.10 below) both Respondents submitted by referring to document (1), page 6, lines 53 to 72, and document (3), page 48, third conclusion, that the skilled person would have had no difficulties in choosing the proper reaction conditions, which would favour the isomerisation reaction over the disproportionation reaction.

4.3 Moreover, the examples in the patent in suit, which are not disputed by the Respondents, provide a clear teaching how to perform the claimed process.

4.4 Therefore, in the Board's judgment, the claimed invention is disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art without undue burden or inventive activity. Thus, the requirements under Article 83 EPC are met.

5. *Novelty*

5.1 After examination of the cited prior art, the Board has reached the conclusion that the subject-matter of the present claims is novel. Since during the oral proceedings novelty was not disputed anymore, it is not necessary to give detailed reasons for this finding.

6. *Inventive step*

6.1 Article 56 EPC sets forth that an invention involves an inventive step if, having regard to the state of the art (in the sense of Article 54(2) EPC), it is not obvious to a person skilled in the art.

6.2 For deciding whether or not a claimed invention meets this criterion, the Boards of Appeal consistently apply the problem and solution approach, which consists essentially in (a) identifying the closest prior art, (b) assessing the technical results (or effects) achieved by the claimed invention when compared with the closest state of the art established, (c) defining the technical problem which the invention addresses and successfully solves, and (d) examining whether or not a skilled person starting from the closest prior art **would** arrive at something falling within Claim 1 by following the suggestions made in the prior art in the sense of Article 54(2) EPC.

6.3 In the present case, the Board considers - in agreement with both parties - that the closest state of the art is document (1).

This document discloses - in conformity with the submissions of the parties - a process for preparing R-114a comprising:

(a) subjecting R-113, obtained by fluorinating perchloroethylene with HF in the presence of an antimony chlorofluoride catalyst, to disproportionation and isomerisation (rearrangement) to produce a crude reaction mixture containing $C_2Cl_2F_4$ (usually more than 90% R-114a) and $C_2Cl_3F_3$ (usually more than 90% R-113a) (see page 10, lines 20 to 27, and lines 58 to 70),

(b) fractionally distilling to separate $C_2Cl_2F_4$ (mostly R-114a) and $C_2Cl_1F_5$ from said reaction mixture (see page 10, lines 71 to 73),

(c) recycling the entire remaining part of the reaction mixture including $C_2Cl_3F_3$ (mostly R-113a) and low fluorine content disproportionation products to the fluorination reactor for fluorination (see page 10, lines 73 to 78),

(d) fluorinating the isomerisation product $C_2Cl_3F_3$

(mostly R-113a) in the presence of an antimony chlorofluoride catalyst to R-114a under relatively mild conditions, whereby the symmetric compound R-113 is not fluorinated (see page 10, lines 80 to 85, and lines 104 to 109),

(e) distilling the output of the fluorination reactor to separate the obtained R-114a from said symmetric compound R-113 (see page 10, lines 89 to 92),

(f) combining the so obtained R-114a with the $C_2Cl_2F_4$ product (mostly R-114a) from the disproportionation-isomerisation reactor separated as indicated in step (b) (see page 10, lines 94 to 96), and

(g) recycling said symmetric compound R-113 as obtained in step (e) to the disproportionation-isomerisation reactor as indicated in step (a).

Moreover, document (1) discloses that by operating this process almost quantitative conversion of R-113 to $C_2Cl_2F_4$ (usually more than 90% of the isomer R-114a) may be achieved (see page 10, lines 96 to 100).

6.4 In view of these high yields of R-114a, and in the absence of convincing evidence that according to the process of the patent in suit compared to the process of document (1) a further improvement in this respect has been achieved, the Board sees as the only objective advantage of the process of present Claim 1 of the patent in suit the omittance of the fractional distillation step (corresponding to step (b) of the process of document (1)) between the isomerisation step and the fluorination step.

6.5 Therefore, in the Board's judgment, the technical problem underlying the patent in suit in the light of the closest state of the art can be seen in the provision of a simplified process for preparing R-114a in comparable high yields (see also page 2, lines 16 to 26, in which passage the problem of separating the R-114 by-product from the desired R-114a is emphasised).

6.6 The patent in suit suggests as the solution to this problem, a process for preparing R-114a according to present Claim 1, which is essentially characterised by (i) isomerising the R-113 starting compound, whereby the isomerisation rate from R-113 to R-113a is higher than the disproportionation rate to R-112a and R-114a, (ii) transferring the isomerisation product as it is to a reactor for fluorination, and (iii) performing the fluorination in the presence of a catalyst comprising a halide or oxide of Cr (see point VI above).

6.7 In view of the technical information provided by the patent in suit, in particular by the Examples 1 to 10, 13 and 14 showing the forming of R-114a together with minor yields of the undesirable R-114 by-product, as well as the Examples 7a and 8a filed by the Appellant with letter dated 21 September 1995 giving yields of dichloro-tetrafluoroethane mixtures of 97,8% (91,8% R-114a) and 98,9% (97,5% R-114a), respectively, the Board considers it plausible that the technical problem as defined above has been solved. Actually, the Respondents did not contest the Appellant's submissions in this respect.

6.8 In assessing inventive step, the next question thus is whether a skilled person starting from document (1) and by following the suggestions made in the cited prior art as a whole, when trying to solve the technical problem indicated above, would arrive at something falling within Claim 1 of the patent in suit.

6.9 Document (1) discloses - as indicated above under point 6.3 - a process for preparing R-114a comprising subjecting R-113 to disproportionation and isomerisation to produce a crude product containing $C_2Cl_2F_4$ (mostly R-114a) and $C_2Cl_3F_3$ (mostly R-113a), separating $C_2Cl_2F_4$ and $C_2Cl_1F_5$ from this crude product, transferring the remaining product to the fluorination reactor for fluorination, fluorinating the isomerisation product $C_2Cl_3F_3$ (mostly R-113a) in the presence of an antimony chlorofluoride catalyst to R-114a, separating the obtained R-114a from the fluorination product containing R-113, and combining the so obtained R-114a with the $C_2Cl_2F_4$ (mostly R-114a) product from the disproportionation-isomerisation reactor, and recycling the remaining part of the fluorination step to the disproportionation-isomerisation reactor.

Therefore, this disclosure does not provide any incentive to the skilled person that the technical problem underlying the patent in suit as defined above could be solved in accordance with present Claim 1 involving - as indicated above under point 6.6 - isomerising the R-113 starting compound to R-113a at an isomerisation rate higher than the disproportionation rate to R-112a and R-114a, transferring the isomerisation product as it is to a reactor for fluorination, and performing the fluorination in the presence of a catalyst comprising a halide or oxide of

Cr.

6.10 In this context, the Board observes that it agrees with the Respondents' submissions that it was known from document (1) (a) that by selecting proper conditions the isomerisation reaction of the starting compound R-113 to R-113a could be caused to predominate over the disproportionation reaction (see page 6, lines 53 to 72; Examples 1 to 11; and page 10, lines 12 to 57), (b) that the isomerisation product R-113a can be fluorinated to R-114a under relatively mild fluorination conditions (see page 10, lines 80 to 85), and (c) that the fluorination of R-113 and the reaction product R-114a requires more drastic fluorination conditions (see page 1, lines 32 to 37; and page 10, lines 96 to 109).

However, document (1) clearly suggests with respect to the production of mainly R-113a to use reaction conditions providing a maximum isomerisation conversion of the starting compound R-113 (see page 10, lines 18 to 57), whereas it then clearly teaches with respect to the production of solely R-114a to perform the disproportionation-isomerisation reaction of the starting compound R-113 in such a way that the desired R-114a is obtained as one of two major products, to separate said product R-114a and subsequently to fluorinate the other major product R-113a in order to obtain additional R-114a as indicated above under point 6.3.

Moreover, although the skilled person might have derived from document (1) that under relatively mild fluorination conditions the desired R-114a obtained in the disproportionation-isomerisation step would not be further fluorinated, in the Board's judgment, the skilled person having regard to the teaching of document (1) as a whole would rather consider that, under the reaction conditions to be applied for fluorinating the obtained R-113a, a further conversion of said reaction product R-114a by disproportionation could be expected and that in order to avoid this side-reaction the applied step for separating R-114a before the fluorination step would be necessary for obtaining high yields of this compound.

In this context, the Board observes that according to document (1) chromium modified catalysts, i.e. catalysts of the type to be used in the fluorination step of the process according to present Claim 1 of the patent in suit, may be employed in the event that predominantly disproportion is desired (see page 6, lines 68 to 72), and that according to the Examples 24 to 30 in said document, illustrating disproportionation reactions of R-113 and/or R-113a at relatively low temperatures of 100°C to 300°C over such a catalyst, a further disproportionation of the $C_2Cl_2F_4$ (thus including R-114a) to CF_3CF_2Cl occurs together with some disproportionation of the lower fluorine content materials (see page 11, lines 45 to 49).

Therefore, in the Board's judgment, the skilled person having considered the content of document (1) as a whole would not have any reason to solve the technical problem as defined above by replacing the process for preparing R-114a as disclosed in document (1) by the process in accordance with present Claim 1.

6.11 Documents (3) and (12), referred to by the Respondents in order to show that the catalytical isomerisation-disproportionation of the starting compound R-113 to R-113a was well known and could be directed to a predominant isomerisation reaction by selecting proper reaction conditions, are not more relevant than document (1) in this respect (see the considerations under point 6.10, first and second paragraph). In this context, the Board observes that according to document (12) the catalytical isomerisation of R-113 must be carried out at low temperatures of 15 to 25°C (liquid phase) (see document (12), column 1, lines 44 to 57), whereas the process as claimed in the patent in suit is carried out in the gas phase, and that document (3) actually confirms the disclosure in document (1) that the use of Cr comprising catalysts would favour disproportionation of the obtained R-114a, thus limiting its yield, if it would not be separated from the crude isomerisation-disproportionation product before carrying out the fluorination step as indicated in document (1) (see point 6.10 above, fourth paragraph; as well as document (3), page 48, point 4 of the conclusions, and page 46, Table 6, last line).

6.12 Documents (2), (5), (6) and (8) were cited by the Respondents in order to show that Cr comprising catalysts as applied in the fluorination step according to present Claim 1 of the patent in suit were well-known catalysts for fluorination reactions involving the exchange of chlorine by fluorine. The Board agrees that said catalysts were indeed known fluorination catalysts, but none of the cited documents gives any pointer to the skilled person that a fluorination of a crude reaction mixture obtained by the disproportionation-isomerisation reaction of R-113 in accordance with document (1) containing R-114a as one of the major reaction products would selectively give a total yield of R-114a of more than 90% in the presence of such a catalyst, let alone a pointer to the solution of the above defined technical problem underlying the patent in suit in accordance with present Claim 1.

This conclusion, of course, also counts for Figure 3 in document (2) representing a sequence of possible reactions in fluorinating C_6Cl_6 involving fluorine uptake, chlorine uptake and isomerisation because of the use of AlF_3 as the fluorination catalyst instead of a Cr comprising catalyst as used in accordance with present Claim 1 of the patent in suit, and because of the fact that this document as a whole clearly teaches that isomerisations are inhibited if said AlF_3 catalyst comprises Cr (see page 137 under "General Conclusions", last paragraph).

6.13 The Board notes that in view of the teaching of the cited documents, and in particular for the reasons as submitted by the Respondents indicated above under point 6.10, first paragraph, and the fact that it was known that Cr comprising catalysts could be used for fluorination reactions, a skilled person **could** have performed the preparation of R-114a in accordance with the patent in suit. However, according to the consistent case law of the Boards of Appeal for determining lack of inventive step, it is necessary to show that considering the teaching of the relevant prior art as a whole, without using hindsight based on the knowledge of the claimed invention, the skilled person **would** have arrived at the **claimed solution of the technical problem to be solved**. However, as indicated above, a skilled person, when trying to solve the technical problem underlying the patent in suit, would not have expected that a process such as the one now claimed according to the patent in suit would solve the present technical problem with a reasonable chance of success.

6.14 For the above reasons, the Board concludes that the solution of the existing technical problem, as claimed in Claim 1, was not obvious in the light of the cited documents. Therefore, the process according to present Claim 1 involves an inventive step in the sense of Article 56 EPC. Furthermore, the dependent Claims 2 and 3 relating to particular embodiments of the process of Claim 1 derive their patentability from that of the present independent Claim 1.

6.15 Finally, the Board observes that in order to meet the requirements of Article 84 EPC, i.e. to avoid doubts as to the matter for which protection is sought by the patent in suit, the description of the patent in suit must be brought into conformity with the present claims. In this context, and having regard to the considerations above (see points 3.1 to 3.3), it is clear that such an adaption of the description also comprises the deletion of all examples falling outside the scope of the present claims. These examples are Examples 11, 12, 15 and 16 using fluorination catalysts which do not contain Cr, as well as Example 17 involving a filtration step between the isomerisation reaction and the fluorination reaction.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent on the basis of the following documents:

    - Claim 1 filed with letter dated 18 August 1997.

    - Claims 2 and 3 filed with letter dated 21 September 1995.

    - A description to be adapted.

The Registrar: The Chairman:

N. Maslin A. Nuss