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**Datasheet for the decision  
of 4 June 2009**

**Case Number:** T 0069/05 - 3.3.07

**Application Number:** 96303368.3

**Publication Number:** 0743093

**IPC:** B01J 27/26

**Language of the proceedings:** EN

**Title of invention:**

Highly active double metal cyanide complex catalysts

**Patent Proprietors:**

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**Opponents:**

- (01) Shell Internationale Research Maatschappij B.V.  
(02) THE DOW CHEMICAL COMPANY

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 123(2)

**Relevant legal provisions (EPC 1973):**

EPC Art. 54, 83, 111(1)

**Keyword:**

"Fresh ground of opposition (no) - Main Request"

"Amendments - allowable (no) - Main, First and Second  
Auxiliary Requests"

"Amendments - allowable (yes) - Third Auxiliary Request"

"Sufficiency of the disclosure (yes) - Third Auxiliary  
Request"

"Novelty (yes) - Third Auxiliary Request"

"Remittal (yes) - Third Auxiliary Request"

**Decisions cited:**

G 0009/91, G 0010/91, G 0001/03, T 0332/87, T 0961/04

**Catchword:**

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Case Number: T 0069/05 - 3.3.07

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.07**  
**of 4 June 2009**

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**Decision under appeal:**            **Decision of the Opposition Division of the  
European Patent Office posted 18 November 2004  
revoking European patent No. 0743093 pursuant  
to Article 102(1) EPC.**

**Composition of the Board:**

**Chairman:**            S. Perryman  
**Members:**            G. Santavicca  
                          D. Semino

## Summary of Facts and Submissions

- I. The appeal lies from a decision of the Opposition Division revoking European patent No. 0 743 093, granted on European application No. 96 303 368.3.
- II. The application as filed comprised 18 claims, Claims 1 to 7 reading, respectively, as follows (for Claims 6 and 7 only the parts that are relevant to the present decision are reproduced):

"1. A method of making a double metal cyanide (DMC) complex catalyst, said method comprising reacting aqueous solutions of a metal salt and a metal cyanide salt in the presence of an organic complexing agent, wherein one or both of the reactant solutions contains the complexing agent, and wherein the metal cyanide salt solution is added to the metal salt solution."

"2. A method as claimed in claim 1 characterised in that the DMC complex catalyst is a zinc hexacyanocobaltate."

"3. A method as claimed in claim 1 or claim 2 characterised in that the organic complexing agent is selected from alcohols, aldehydes, ketones, ethers, esters, amides, ureas, nitriles, sulfides and mixtures thereof."

"4. A method as claimed in claim 3 characterised in that the organic complexing agent is a tertiary alcohol."

"5. A method as claimed in claim 4 characterised in that the organic complexing agent is tertiary butyl alcohol."

"6. A catalyst which consists essentially of a substantially amorphous zinc hexacyanocobaltate complex, wherein the catalyst is prepared in the presence of a water-soluble aliphatic alcohol complexing agent selected from the group consisting of ethanol, sec-butyl alcohol, n-butyl alcohol, and isobutyl alcohol, and exhibits an X-ray diffraction pattern of ... ."

"7. A zinc hexacyanocobaltate complex catalyst having, as a complexing agent, a water-soluble aliphatic alcohol selected from the group consisting of ethanol, sec-butyl alcohol, and isobutyl alcohol, wherein the catalyst, when analyzed by powder X-ray ...".

III. The patent in suit was granted with 6 Claims, reading respectively as follows (additions to the respective claims as filed shown in bold, deletions in strike-through) (Claims 3 and 4, not present in the set of claims of the application as filed, are shown in bold):

"1. A method of making a double metal cyanide (DMC) complex ~~catalyst~~, ~~said~~ **which** method comprises ~~ing~~ reacting **an** aqueous solutions of a metal salt and **an aqueous solution of a** metal cyanide salt ~~in the presence of an organic complexing agent~~, wherein one or both of the reactant solutions contains ~~the~~ **an organic** complexing agent, and wherein the metal cyanide salt solution is added to the metal salt solution."

~~"32. A method as claimed in~~ **according to** claim 1 ~~or claims 2 characterised in that~~ **wherein** the organic complexing agent is selected from **an** alcohols, aldehydes, ketones, ethers, esters, amides, ureas, nitriles, sulfides ~~and~~ **or a** mixtures thereof".

**"3. A method, according to claim 2 wherein the alcohol is a water-soluble aliphatic alcohol."**

**"4. A method according to claim 3 wherein the water-soluble aliphatic alcohol comprises ethanol, isopropyl alcohol, n-butyl alcohol, sec-butyl alcohol, tert-butyl alcohol, isobutyl alcohol or a mixture thereof".**

~~"5. A method as claimed in~~ **according to** claim 4 ~~characterised in that the organic complexing agent is~~ **wherein the water soluble aliphatic alcohol comprises tertiary -butyl alcohol"**.

~~"26. A method as claimed in claim 1 characterised in that~~ **according to any preceding claim wherein** the DMC complex catalyst is a zinc hexacyanocobaltate."

- IV. Three oppositions were filed against the patent, on the grounds that:
- (a) it contained subject-matter extending beyond the content of the application as filed (Article 100(c)) (opponents 02);
  - (b) it 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 (Article 100(b) EPC) (opponents 01 and 02); and,
  - (c) the claimed subject-matter lacked novelty and an inventive step (Article 100(a) EPC) (all opponents).

By letter dated 9 July 2004, Opponents 03 withdrew their opposition.

V. The decision under appeal was based on Claims 1 to 4 filed with letter of 22 May 2003, which read as follows (additions to the respective claims as granted in bold, deletions in strike-through):

"1. A method for making a double metal cyanide (DMC) complex, **catalyst** which method comprises reacting an aqueous solution of a metal salt and an aqueous solution of a metal cyanide salt wherein one or both of the reactant solutions contains an organic complexing agent **which is a water-soluble aliphatic alcohol** and wherein the metal cyanide salt solution is added to the metal salt solution."

~~"2. A method according to Claim 1 wherein the complexing agent is selected from an alcohol, aldehyde, ketone, ether, ester, amide, urea, nitrile, sulfide or a mixture thereof."~~

~~"3. A method, according to Claim 2 wherein the alcohol is a water soluble aliphatic alcohol."~~

"42. A method according to claim 31 wherein the water-soluble aliphatic alcohol comprises ethanol, isopropyl alcohol, n-butyl alcohol, sec-butyl alcohol, tert-butyl alcohol, isobutyl alcohol or a mixture thereof".

"53. A method according to claim 42 wherein the water soluble aliphatic alcohol comprises tert-butyl alcohol".



"64. A method according to any preceding claim wherein the DMC complex is a zinc hexacyanocobaltate.".

VI. The Opposition Division revoked the patent on the basis of reasoning which can be summarised as follows:

- (a) "The objections raised by Opponents I and II on the basis of Article 123(2) EPC (ground for opposition under Article 100(c)) were abandoned during the oral proceedings and the Opposition Division is of the opinion that the new set of claims is admissible under Article 123(2) EPC because it is based on claim 1 as originally filed and on line 16 of page 13 of the description as originally filed." [Note by Board: this line 13 reads "Preferred complexing agents are water-soluble aliphatic alcohols selected from"]
- (b) The lack in the claims of the feature "homogenisation" or "intimate mixing" allegedly essential for attaining a certain catalytic performance was not a matter of insufficiency of the disclosure. Whether or not the activity of the catalyst was high was also irrelevant for the issue of insufficiency of the disclosure, albeit it could play a role in the assessment of inventive step.
- (c) The claimed subject-matter lacked novelty having regard to D8 (JP-A-6-41 293 and its English translations), because the ethylene glycol dimethyl ether used in Example 1 of D8 could be replaced by any of the preferred water soluble aliphatic alcohols such as isopropyl-alcohol and tert-butanol mentioned in the description of D8, and the mixture of water, ethylene glycol dimethylether, zinc chloride and saponite was a

solution of the first three compounds containing saponite, as no mention of any preliminary contact time between metal salt solution and saponite before the addition of the metal cyanide solution was present in Example 1.

- (d) Therefore, a ground of opposition under Article 100(a) EPC prejudiced the maintenance of the patent in suit, which should be revoked.

VII. In their statement setting out the grounds of appeal, the appellants maintained the set of amended Claims 1 to 4 underlying the decision under appeal as the sole request.

VIII. In response to the statement setting out the grounds of appeal:

Opponents 01 (respondents 01), in their letter dated 25 July 2005, maintained the ground of lack of novelty, having regard to each of D8 and D3 (EP-A-0 555 053), and objected to the amendments "water soluble aliphatic alcohol" and "mixtures thereof" in Claims 1 and 2, respectively, under Article 123(2) EPC.

Opponents 02 (respondents 02), maintained the grounds of opposition under Article 100 EPC, paragraphs (a) and (b) (letter dated 28 July 2005).

IX. The Board, in a communication in preparation for oral proceedings summarising the points to be discussed, *inter alia* raised the questions of whether or not the objections to the amendments such as "water soluble aliphatic alcohol" and "mixtures thereof" in Claims 1 and 2, respectively, constituted a fresh ground of opposition under Article 100(c) EPC, as well as of

whether D8 or D3 directly and unambiguously disclosed the subject-matter of Claim 1 of the Main Request.

- X. In response to the communication of the Board:
- (a) The appellants maintained the claims underlying the decision under appeal as the Main Request and submitted further amended claims as First to Third Auxiliary Requests (letter dated 29 April 2009).
  - (b) Respondents 01 maintained their objections (letter dated 27 April 2009).
  - (c) Respondents 02 announced (letter dated 31 March 2009) and confirmed (letter dated 7 May 2009) that they would not attend the oral proceedings.

XI. The claims of the First to Third Auxiliary Requests read, respectively, as follows (additions to the claims as granted shown in bold, deletions in strike-through):

*First Auxiliary Request*

"1. A method for making a double metal cyanide (DMC) complex~~7~~ **catalyst** which method comprises reacting an aqueous solution of a metal salt and an aqueous solution of a metal cyanide salt wherein one or both of the reactant solutions contains an organic complexing agent **which is a water-soluble aliphatic alcohol selected from the group consisting of ethanol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, tert-butyl alcohol, and mixtures thereof**, and wherein the metal cyanide salt solution is added to the metal salt solution."

"52. A method according to claim 41 wherein the water soluble aliphatic alcohol comprises tert-butyl alcohol".

"63. A method according to ~~any preceding~~ claim **1 or claim 2** wherein the DMC complex is a zinc hexacyanocobaltate.".

*Second Auxiliary Request*

"1. A method for making a double metal cyanide (DMC) complex, **catalyst** which method comprises reacting an aqueous solution of a metal salt and an aqueous solution of a metal cyanide salt wherein one or both of the reactant solutions contains an organic complexing agent **which is a water-soluble aliphatic alcohol** and wherein the metal cyanide salt solution is added to the metal salt solution."

"42. A method according to claim 31 wherein the water-soluble aliphatic alcohol ~~comprises~~ **is selected from the group consisting of** ethanol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, **and** tert-butyl alcohol, ~~or a mixture thereof~~."

"53. A method according to claim 42 wherein the water soluble aliphatic alcohol ~~comprises~~ **is** tert-butyl alcohol".

"64. A method according to any preceding claim wherein the DMC complex is a zinc hexacyanocobaltate.".

*Third Auxiliary Request*

"1. A method for making a double metal cyanide (DMC) complex, **catalyst** which method comprises reacting an aqueous solution of a metal salt and an aqueous

solution of a metal cyanide salt wherein one or both of the reactant solutions contains an organic complexing agent **which is a water-soluble aliphatic alcohol selected from the group consisting of ethanol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, and tert-butyl alcohol**, and wherein the metal cyanide salt solution is added to the metal salt solution."

"52. A method according to claim 41 wherein the water soluble aliphatic alcohol ~~comprises~~ **is** tert-butyl alcohol".

"63. A method according to ~~any preceding~~ claim **1 or claim 2** wherein the DMC complex is a zinc hexacyanocobaltate.".

XII. Oral proceedings were held on 4 June 2009, in the announced absence of respondents 02, in compliance with Rule 115(2) EPC.

XIII. The arguments of the appellants, as far as they relate to the present decision, can be summarised as follows:

*Procedural matters*

The ground of opposition under Article 100(c) EPC, raised by opponents 02 in their statement of the grounds on which the opposition was based, was withdrawn during the oral proceedings held on 8 November 2004, as apparent from the minutes thereof. Although the patent had been revoked, no case law was in support of a revival of abandoned grounds of opposition. Moreover,

the features "water-soluble aliphatic alcohol" and "mixture thereof" as mentioned in Claims 1 and 2 of the Main Request, were defined in Claims 3 and 4 as granted, so that they did not arise out of amendments to the claims made during the opposition proceedings. Hence, the latest objections of respondents 01 were a fresh ground of opposition, pursuant to Enlarged Board of Appeal decisions G 9/91 (OJ 1993, 408) and G 10/91 (OJ 1993, 420), for the introduction of which in the appeal proceedings the proprietors appellants gave no consent. In fact, since added subject-matter was not treated uniformly in the contracting states, the appellants preferred not to have it dealt with in the appeal proceedings.

*Main Request*

*Amendments*

The feature "water-soluble aliphatic alcohol" in Claim 1 of the Main Request was based on a passage of the application as filed (page 13, lines 16-19), so that Claim 1 of the Main Request was allowable.

*First Auxiliary Request*

*Amendments*

Claim 1 of the First Auxiliary Request was based on a passage of the application as filed (page 13, lines 4 to 19). Part of that disclosure was defined in Claim 3 of the application as filed, from which it was apparent that mixtures of *inter alia* alcohols as such were included in the scope of the invention, which evidently

applied to all of the alcohols mentioned. Hence, the expression "mixture thereof" applied to the alcohols defined in Claim 1 and did not add any subject-matter beyond the content of the application as filed.

*Second Auxiliary Request*

*Amendments*

The arguments submitted in connection with the amendments in the claims of the Main Request applied *mutatis mutandis* to the amendment "water soluble aliphatic alcohol" in Claim 1 of the Second Auxiliary Request.

*Third Auxiliary Request*

*Amendments*

The objections raised against the features "water soluble aliphatic alcohol" and "mixtures thereof" present in the amended claims of the Main, First and Second Auxiliary Requests did not apply to the claims of the Third Auxiliary Request, so that they indisputably complied with Article 123(2) EPC.

*Sufficiency of the disclosure*

It had not been demonstrated that the invention as claimed was insufficiently disclosed.

*Novelty*

D8 disclosed several complexing agents, reactants and methods, so that a number of choices were necessary to arrive at the claimed subject-matter. In particular, there was no specific disclosure of any water soluble alcohols in solutions of metal salts and cyanide salts and, as well as water, the solution of D8 should contain a ligand as solvent. Also, Example 1, one of the four ways of preparing the DMC catalyst illustrated within the general teaching of D8 summarised in Paragraph [0018], illustrated the use of ethylene glycol dimethyl ether (glyme) and not of a water soluble alcohol as claimed. In any case, D8 obligatory required the presence of a carrier and did not disclose whether alcohols such as tert-butyl or isopropyl were to be used in specific embodiments as those of Example 1 or as those of Comparative Example 1. Hence, D8 did not disclose that the conditions of its Example 1, individualised for glyme, likewise applied to the preferred alcohols, not even in Paragraph [0013] of D8, which merely said that isopropyl and tert-butyl alcohols were particular preferred without mentioning any particulars thereof. Furthermore, D8 mentioned ion exchange on the carrier and did not contain a disclosure that zinc chloride must be in solution, so that in Example 1, where saponite was used, it was not clear that zinc was still in solution. Example 2 of D8, where ion exchange was high, gave better results than Example 1, showing that ion exchange was beneficial. Therefore, D8 did not directly and unambiguously disclose the claimed subject-matter. The alleged whole content of D8 resulting from reading Example 1 in the context of the description amounted to a retrospective



target modification of the composition illustrated in Example 1. As regards decision T 332/87 (not published in the OJ EPO but acknowledged in the Case Law of the Boards of Appeal of the EPO, 5th edition 2006, I.C.2.2), invoked by the respondents to support their arguments, its requirements were not contested, but that decision concerned a different situation, i.e. one in which the claimed subject-matter was distinguished from a composition exemplified in a prior art document by the presence of a filler, which according to the description of the same prior art document could be added to all of the compositions exemplified.

D3 did not disclose the order of addition of the metal and the cyanide salt solutions as defined in Claim 1 according to all of the requests nor that a water-soluble aliphatic alcohol was used in either or both of the solutions to be mixed. The ligand was generally defined in D3, by means of a long list that included water soluble aliphatic alcohols, with ketones and ethers being preferred ligands. Although comparative Example 6 illustrated the steps and the order as defined in Claim 1 of all the requests, it did not mention the presence of a ligand in, or the addition to, any of the two solutions.

No other document had not been invoked against novelty in the appeal proceedings.

Therefore, the claimed subject-matter of all of the requests was novel.

*Inventive step*

Although the claimed subject-matter involved an inventive step, that issue had not been dealt with in the decision under appeal, so that remittal to the first instance was appropriate, if novelty was acknowledged.

- XIV. The arguments of the respondents, as far they relate to the present decision, can be summarised as follows:

*Procedural matters*

According to respondents 01, the amendments "water-soluble aliphatic alcohol" (Claim 1 of the Main Request) and "or a mixture thereof" (Claim 2 of the Main Request) both contravened the requirements of Article 123(2) EPC. The ground of added subject-matter under Article 100(c) EPC had been raised in the statement accompanying the notice of opposition and the proprietors were aware of it. Although the statement made by opponents at the oral proceedings before the Opposition Division, and mentioned in the minutes of the oral proceedings, could not be denied, no case law however dealt with whether or not raised and withdrawn ground of opposition, if subsequently revived, became fresh, let alone that objections under Article 123(2) EPC could not be raised in appeal proceedings against new requests.

*Main Request*

*Amendments*

In Claim 1, the feature "water soluble aliphatic alcohol" was not limited by the feature "selected from

the group consisting of ...", as disclosed originally. Since Claim 1 encompassed water-soluble aliphatic alcohols beyond those disclosed in the application as filed, it was thus not allowable (Article 123(2) EPC).

*First Auxiliary Request*

*Amendments*

In view of the feature "mixtures thereof" in Claim 1, specific mixtures of alcohols were now claimed which had not all been disclosed in the application as filed. This lack of disclosure became particularly apparent if one considered that during the further proceedings on e.g. inventive step the number of alcohols listed could be reduced further, e.g. in order to define more specific mixtures, including mixtures of any two of the specific alcohols mentioned, not disclosed initially however.

Also the feature "comprises tert-butyl alcohol" (Claim 2) encompassed further undefined alcohols, not disclosed in the application as filed.

Hence, the amended claims were not allowable.

*Second Auxiliary Request*

*Amendments*

The objections raised against Claim 1 of the Main Request applied *mutatis mutandis* to Claim 1 of the Second Auxiliary Request, as it still contained the features "water soluble aliphatic alcohol". The Second Auxiliary Request was not allowable either.

### *Third Auxiliary Request*

#### *Amendments*

The amended claims of the Third Auxiliary Request no longer included the objected to features.

#### *Insufficiency of the disclosure*

According to respondents 02, the disclosure of the invention was insufficient, unless it was accepted that the invention solved no technical problem based on any "higher activity" of the catalysts obtained by using the steps of the claimed method. In particular, the claimed method did not specify any step of "homogenisation", presented as being essential to obtain a higher activity but not sufficiently disclosed in its particulars.

#### *Novelty*

As regards lack of novelty, the claimed method differed from the method illustrated in Example 1 of D8 only in one feature, namely the use of a water-soluble aliphatic alcohol as a ligand, instead of ethylene glycol dimethyl ether. However, Paragraph [0013] of D8 mentioned water-soluble aliphatic alcohols as ligands, *inter alia* isopropyl alcohol and tert-butyl alcohol, which were presented as being particularly preferred. Hence, all of the features of Claim 1 of the Main Request were separately disclosed in D8 and a whole content approach should be used to assess whether their combination too was disclosed by D8. This meant that the cited passages of D8 should be put in context, as established in e.g.

T 332/87 (*supra*), according to which: one section of a disclosure could be combined with another section within the same document, unless anything prevented doing it (first requirement); and, the teaching of an example of a document could be combined with the general teaching in its description provided that the example was representative of or in line with that general teaching (second requirement). The general teaching of D8 was described in any of Paragraphs [0008] and [0009] and merely required the presence of a solid carrier. Example 1 of D8 illustrated one use of a solid carrier, i.e. was representative of that general teaching. Moreover, Paragraph [0013] of D8, relating to the organic ligand "R" mentioned in the formula of the complex given in Paragraph [0010], disclosed the use of isopropyl and tert-butyl alcohols, instead of ethylene glycol dimethyl ether, so that nothing prevented the combination of Example 1 with Paragraph [0013] of D8. As regards the further features defined in Claim 1, Example 1 of D8 illustrated an aqueous solution of zinc chloride as metal salt, glyme as ligand and a metal cyanide salt. The presence of powdery saponite (solid carrier) did not exclude the existence of a solution of zinc chloride, as acknowledged in the decision under appeal, since Example 1 of D8 did not mention any contact time between zinc chloride and saponite, as done in Example 2 of D8, in which ion exchange was disclosed. Since glyme and tert-butyl alcohol were equally preferred in D8, by applying the rules of T 332/87 (*supra*), the skilled person arrived at the claimed subject-matter, which thus lacked novelty.

By mentioning a reversal of the preferred order of addition of the aqueous solutions of metal salt and

metal cyanide salt of its method, D3 inevitably disclosed a method as claimed, and was novelty destroying too.

*Inventive step*

The claimed method, if novel, lacked an inventive step.

*Remittal*

Inventive step had not been dealt with in the decision under appeal. If the subject-matter of Claim 1 of any requests were found to be novel, the case should be remitted to the first instance for further prosecution.

- XV. The appellants (patent proprietors), at the oral proceedings, requested that the decision under appeal be set aside, that the ground that the patent contains subject-matter which extends beyond the content of the application as filed not be admitted in the appeal proceedings and that the matter be remitted to the first instance for further prosecution as Main Request on the basis of Claims 1 to 4 filed 22 May 2003 or on the basis of the claims of the First, Second or Third Auxiliary Requests filed 29 April 2009.
- XVI. Respondents 01 (opponents 01), at the oral proceedings, requested that the appeal be dismissed.
- XVII. Respondents 02 (opponents 02) had requested in writing that the appeal be dismissed (letter dated 28 July 2005) and, if the decision under appeal were overturned, that the matter be remitted to the first instance for

addressing the issue of inventive step (letter dated 31<sup>st</sup> March 2009).

XVIII. At the end of the oral proceedings held on 4 June 2009 the decision was announced.

## **Reasons for the Decision**

1. The appeal is admissible.

### *Procedural matters*

2. The Opposition Division, in compliance with then applicable Article 102(3) EPC 1973 decided that taking into consideration the amendments made by the proprietor of the patent during the opposition proceedings, the patent and the invention to which it related met the Requirements of the EPC. In doing so it specifically also decided that "the new set of claims is admissible under Article 123(2) EPC because it is based on claim 1 as originally filed and on line 16 of page 13 of the description as originally filed." (See point VI(a) *supra*). The correctness of this part of the decision under appeal is challenged by the respondents.

2.1 *Prima facie* a party is entitled to challenge the correctness of what was decided in the decision under appeal, either as appellant or, as is the case here, in response to an appeal by another party, as being another reason for dismissing the appeal.

2.2 Decisions G 9/91 and G 10/91 (*supra*) of the Enlarged Board of Appeal are concerned with a different

situation, namely where an opponent in appeal proceedings seeks to rely on a fresh ground of opposition which was not relied on in the original opposition nor allowed into the proceedings and decided on by the opposition division. These Enlarged Board cases are thus not applicable to prevent the respondents here from challenging whether amended Claim 1 complied with Article 123(2) EPC.

2.3 In the absence of any Enlarged Board of Appeal decision restricting the right of an opponent to complain that a claim does not meet the requirements of an Article of the EPC which is a ground of opposition and which featured in the decision under appeal, this Board is not prepared to restrict the opponents rights, whether by an extrapolation from decisions G 9/91 and G 10/91 or otherwise.

2.4 It would not serve procedural economy if before assessing whether a request put forward complies with the requirements of the EPC, the Board first has to assess whether the opponents have not somehow lost the right to complain about some infringement of the requirements of the EPC.

### *Main Request*

### 3. *Amendments*

3.1 Claim 1 of the Main Request *inter alia* contains the feature "which is a water-soluble aliphatic alcohol", as a limitation of the organic complexing agent as defined in Claim 1 as granted.



3.1.1 The claims as filed did not contain any statement that the organic complexing agent can be any water-soluble aliphatic alcohol. Claim 1 (point II, *supra*) only mentions "organic complexing agent", Claim 6 (*idem*) mentions the feature "water soluble aliphatic alcohol complexing agent selected from the group consisting of ethanol, sec-butyl alcohol, n-butyl alcohol, and isobutyl alcohol" and Claim 7 (*idem*) mentions the feature "water soluble aliphatic alcohol selected from the group consisting of ethanol, sec-butyl alcohol, and isobutyl alcohol".

3.1.2 The description as filed contain several instances in which the organic complex agent is described, in particular as follows:

- (a) "Generally, the complexing agent must be relatively soluble in water" (page 13, lines 5-6);
- (b) "Suitable complexing agents are those commonly known in the art, as taught, for example, in U.S. Patent No. 5,158,922" (page 13, lines 6-7);
- (c) "Preferred complexing agents are water-soluble heteroatom-containing organic compounds" (page 13, lines 12-13);
- (d) "Suitable complexing agents include, but are not limited to, alcohols, aldehydes, ketones, ethers, esters, amides, ureas, nitriles, sulfides, and mixtures thereof" (page 13, lines 14-15);
- (e) "Preferred complexing agents are water-soluble aliphatic alcohols selected from the group consisting of ethanol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, and tert-butyl alcohol" (page 13, lines 16-18);
- (f) "Tert-butyl alcohol is most preferred" (page 13, lines 18-19) and is used in several examples;

(g) Catalysts C and E (Table 2) use isopropyl alcohol. None of those instances discloses that the organic complexing agent can be any water-soluble aliphatic alcohol.

3.1.3 There is thus no instance in the application as filed in which the feature "water-soluble aliphatic alcohol" as such is directly and unambiguously disclosed in connection with the term "organic complexing agent" and without any further limitation such as "selected from the group consisting of ethanol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, and tert-butyl alcohol".

3.1.4 The separation of the feature "water-soluble aliphatic alcohol" from "selected from the group consisting of ethanol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, and tert-butyl alcohol" is not based on the application as filed, and constitutes an undisclosed intermediate generalization which contravenes the requirements of Article 123(2) EPC.

3.2 Consequently, the Main Request is not allowable.

#### *First Auxiliary Request*

#### 4. *Amendments*

4.1 Claim 1 of the First Auxiliary Request *inter alia* contains the feature "organic complexing agent which is water-soluble aliphatic alcohols selected from the group consisting of ethanol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, tert-butyl alcohol, and mixtures thereof".

- 4.2 The inclusion of that feature, which was part of the definitions given in Claims 2 to 4 as granted, in Claim 1, has been objected to by respondents 01, because the final limitation "and mixtures thereof" has been applied to the feature "wherein the water-soluble aliphatic alcohol comprises ethanol, isopropyl alcohol, n-butyl alcohol, sec-butyl alcohol, tert-butyl alcohol, isobutyl alcohol", i.e. to mixtures of those alcohols.
- 4.3 As regards any basis therefor in the application as filed, the following is noted:
- 4.3.1 Among the instances mentioning alcohols (points 3.2.2 and 3.2.3, *supra*), the one mentioning the expression "and mixtures thereof" is that disclosed on page 13, lines 14-15, namely "suitable complexing agents include, but are not limited to, alcohols, aldehydes, ketones, ethers, esters, amides, ureas, nitriles, sulfides, and mixtures thereof" (page 13, lines 14-15)".
- 4.3.2 From that disclosure it can be gathered that *inter alia* mixtures of alcohols as such were envisaged, which can be water-soluble (page 13, lines 12-13). However, any further limitation to "aliphatic", let alone to specific ones, is not disclosed therewith.
- 4.3.3 The combination of the expression "and mixtures thereof" (page 13, lines 14-15) with the features mentioned in the passage on page 13, lines 16-18 ("Preferred complexing agents are water-soluble aliphatic alcohols selected from the group consisting of ethanol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, and tert-butyl

alcohol"), as done in Claim 1, implies *inter alia* the use of binary or even ternary mixtures of the specific alcohols listed. The inclusion in the definition of Claim 1 of "mixtures thereof" is directed *inter alia* to undisclosed mixtures of specific alcohols, for which there is no direct and unambiguous basis in the application as filed.

4.4 Since the use of e.g. binary mixtures of aliphatic alcohols are not directly and unambiguously disclosed in the application as filed, the objected to feature of Claim 1 extends the content of the application as filed (Article 123(2) EPC).

4.5 Therefore, the First Auxiliary Request is not allowable.

#### *Second Auxiliary Request*

##### 5. *Amendments*

Claim 1 of the Second Auxiliary Request comprises the feature "which is a water-soluble aliphatic alcohol", which for the reasons given in relation to the Main Request (points 3, *supra*) contravenes the requirements of Article 123(2) EPC, so that the Second Auxiliary Request is not allowable either.

#### *Third Auxiliary Request*

##### 6. *Amendments*

Amended Claims 1 to 3 were not contested as to their formal allowability by the respondents. The Board has no reason to take a different position. In particular,

Claim 1 now includes the limitation stated as such on page 13, lines 16-18, of the application as filed, which specifies a list of water-soluble aliphatic alcohols without mentioning their mixtures. Also, Claim 2 specifies that the water soluble aliphatic alcohol is tert-butyl alcohol, as in Claim 5 of the application as filed. Hence, the requirements of Article 123(2) EPC are fulfilled.

7. *Insufficiency of the disclosure*

- 7.1 Claim 1 of the Third Auxiliary Request concerns a method for making a double metal cyanide (DMC) complex catalyst.
- 7.2 The definition of the invention in Claim 1 does not mention any requirement regarding a higher activity of the catalyst, nor any step of homogenisation therefor. This was acknowledged by respondents 02 (response to the statement of the grounds of appeal, page 2, first full paragraph). Also the fact that, in the present case, the issue of sufficiency was inextricably linked to the issue of inventive step was acknowledged in that response of respondents 02 (*supra*, page 1, last three lines). The ground of insufficiency was conditionally maintained for the case where a higher activity of the catalyst were acknowledged in the whole breadth of the claims.
- 7.3 As pointed out in G 1/03 (OJ 2004, 413, point 2.5.2 of its Reasons), if the achievement of an effect (here the alleged higher activity) is not required by the claims, then whether or not this effect is achieved is relevant only for the purposes of considering inventive step

under Article 56 EPC, since it is relevant to the formulation of the problem to be solved compared to the closest prior art, since it is only legitimate to formulate a problem that can be regarded as solved over the whole breadth of the claims.

7.4 It follows from the above, that the objections raised by respondents 02 rather relate to Article 56 EPC, or possibly clarity under Article 84 EPC (homogenisation), but not to sufficiency.

7.5 In the absence of any further arguments, the Board therefore comes to the conclusion that an insufficiency of the disclosure under Article 100(b) EPC in respect of the invention as defined in the present claims has not been demonstrated.

## 8. *Lack of Novelty*

8.1 In the decision under appeal, the claimed subject-matter was found to lack novelty having regard to D8. In the appeal proceedings, respondents 01 have objected that also D3 was novelty destroying. Hence, it falls to be decided whether or not either of those documents directly and unambiguously discloses the claimed subject-matter.

8.2 D8 discloses a production process for a polyether compound characterized by the presence of a composite metal cyanide compound complex catalyst supported on a solid carrier when manufacturing a polyether compound through a ring opening addition polymerization of a cyclic ether compound alone or in the presence of a hydroxy compound (Claim 1).

8.2.1 In particular, that production process is characterized by a synthesis of a composite metal cyanide complex in the presence of a solid carrier (Claim 7). Hence, D8 discloses a method for making a composite metal cyanide complex catalyst.

8.2.2 The composite metal cyanide complex is represented by the general formula  $M_a[M'(CN)_y]_b(H_2O)_c(R)_d$  (paragraph [0010]), wherein *inter alia*:  
M and M' are metal ions, the use of Zn(II) or Fe(II) being particularly preferred as M (paragraph [0011]) and the use of Co(III) or Fe(III) being particularly preferred as M' (paragraph [0012]), and  
R is an organic ligand selected from ethers, esters, alcohols, aldehydes, ketones, amides, nitriles and sulfides, the selection of an ether or an alcohol being preferred, and the use of at least one ligand selected from ethylene glycol dimethyl ether, dimethylene glycol diethyl ether, isopropyl alcohol, and tert-butanol being particularly preferred (paragraph [0013]).

8.2.3 According to D8, the composite metal cyanide complex catalyst supported on a solid carrier can be manufactured by synthesizing a composite metal cyanide complex in the presence of a solid carrier or the catalyst may be manufactured by supporting a composite metal cyanide complex previously synthesized on a solid carrier (paragraph [0017]). In particular, D8 (paragraphs [0018] and [0019]) mentions two ways for producing the catalyst, one including addition of a cation-exchange material to an aqueous solution comprising a salt of metal M with a halogen, the other including adding a cation-exchange material already

ion-exchanged with cations of M to water to a solution of water and organic ligand. In both methods, an aqueous solution of an alkali metal salt or of an alkaline earth metal salt of a cyanide complex anion having M' is then added.

8.2.4 Hence, the general part of the description of D8 mentions each of the features defined in Claim 1 of the Third Auxiliary Request but not their combination as defined in Claim 1.

8.2.5 In Working Example 1 of D8, five grams of saponite powder were dispersed in a mixed solvent comprising 70 cc of water and 10 cc of ethylene glycol dimethyl ether, and 10 cc of an aqueous solution containing 0.4 g of zinc chloride was added. With agitation, 10 cc of an aqueous solution containing 0.13 g of cobalt potassium cyanate was added drop wise over 30 minutes. The solution temperature was maintained at 40°C. Solids were obtained through centrifuging after one hour of agitation. The solids were washed using an aqueous 30% solution of ethylene glycol dimethyl ether and centrifuging. The solids were subsequently washed with ethylene glycol dimethyl ether and centrifuged. The solids obtained were dried in air at 80°C, and the solid masses obtained were ground to yield a catalyst.

Hence, the method of Claim 1 of to the Third Auxiliary Request is distinguished from the method illustrated in Working Example 1 of D8 only by the fact that one of the specific water soluble aliphatic alcohols as defined in Claim 1, is used instead of ethylene glycol dimethyl ether (glyme).



8.2.6 Working Example 1 of D1 illustrates a specific situation, including all of the particulars as given, which of course have been matched to obtain the desired catalyst. Working Example 1 is not the only example of D8. Other examples of D8 illustrate the use of glyme under different operating conditions, as in Working Examples 2 and 3 and Comparative Example 1.

8.2.7 According to Paragraph [0013] of D8, glyme is preferred, as are tert-butyl and isopropyl alcohols. However, that paragraph concerns the most general definition of the organic ligand "R" in the given formula and merely mentions preferences without disclosing how they should be used in any particular situation. Since D8 does not disclose how to use the further preferred ligands such as isopropyl and tert-butyl alcohols, the addition of the organic ligand after having mixed the two solutions or the use of no solution of zinc chloride, as in Working Example 2, is not excluded by D8. Hence, the replacement of glyme with any of isopropyl or tert-butyl alcohols in the specific situation of Working Example 1 is not directly and unambiguously disclosed by D8, so that it does not take away the novelty of the claimed subject-matter.

8.2.8 This decision is in line with decision T 961/04 of 14 February 2007, taken by another Board, concerning, as in the present case, a target modification of a known example, e.g. the replacement of an element of the known example with an element mentioned in the description, and the assessment of novelty.

The present situation is different from that of case T 332/87 (*supra*), as in that case there was a

disclosure that the addition of a further additive (filler) applied to all of the embodiments illustrated, whilst in the present case there is no specific suggestion that isopropyl or tert-butyl alcohols could replace glyme in Working Example 1.

8.2.9 The Board thus concludes that D8 does not directly and unambiguously disclose the combination of all the features now required by Claim 1, so that D8 is not novelty destroying.

8.3 D3 (Claim 1) discloses a method of preparing a metal cyanide complex catalyst *inter alia* comprising the steps of reacting a first aqueous solution of a water-soluble metal salt with a second aqueous solution of a water-soluble metal cyanide salt, wherein optionally either or both of the first and second aqueous solutions contain a first water miscible heteroatom containing organic ligand selected from alcohols, aldehydes, ketones, ethers, esters, ureas, amides, nitriles and sulfides, to form an aqueous slurry of particulate metal cyanide complex catalyst, combining the aqueous slurry with a second water-miscible heteroatom-containing organic ligand, which may be the same as or different from the first organic ligand, said combining step being optional unless neither the first nor the second aqueous solution contained any water-miscible heteroatom-containing organic ligand, and recovering the particulate metal cyanide complex catalyst from the aqueous slurry by filtration, wherein the reaction step is effected by adding the first aqueous solution to the second aqueous solution.

- 8.3.1 Preferably, the first and second water-miscible heteroatom-containing organic ligands are ethers or ketones (Claim 7).
- 8.3.2 According to D3, to improve the filterability of the double metal cyanide complex catalyst produced by reaction of the water-soluble metal salt and the water-soluble metal cyanide salt, it is critical that the first aqueous solution be added to the second aqueous solution. This particular order of addition leads to the formation of catalyst particles which are much more readily recovered by filtration than if the addition order is reversed, without adversely affecting the polymerization activity of the catalyst. This result was presented as being unexpected, since, the prior art acknowledged in D3 (column 16, lines 4-7, of U.S. Pat. No. 3,829,505) taught that more active catalysts were obtained by adding the alkali metal hexacyanometallate to a metal salt solution (column 6, lines 15 to 29, of D8).
- 8.3.3 Hence, D3 acknowledges that the order of addition of the two solutions as specified in Claim 1 of the Third Auxiliary Request was known for obtaining more active catalysts albeit it did not permit improved filtration. However, that part of D3 does not disclose whether or not any ligands were present and where.
- 8.3.4 In fact, always according to D3 (column 7, lines 15-25), optionally, either or both of the first and second aqueous solutions contain a water miscible heteroatom-containing organic ligand. If neither aqueous solution contains such a ligand, then the aqueous slurry of catalyst produced by reaction of the metal salt and the

metal cyanide salt is combined with a ligand of this type. Of course, portions of the ligand may be present in either the first or second aqueous solutions (or both) with additional portions combined with the aqueous slurry, as the ligand provides even further activation of the double metal cyanide complex catalyst. Hence, D3 does not require that the ligand be present in either or both of the solutions to be mixed.

8.3.5 As regards the examples of D3:

Example 1 illustrates the preparation of a double metal cyanide complex catalyst comprising the addition of the zinc chloride solution to the solution of potassium hexacyanocobaltate, and the addition of glyme (*supra*) after formation of the precipitate.

Comparative Example 6 instead illustrates the criticality of the order in which the reagents are combined. In that example, potassium hexacyanocobaltate was added to a zinc chloride solution (as defined in Claim 1 of the Third Auxiliary Request). However, none of the two solutions contains a ligand. The resulting product clogged the filter.

Examples 10-17 demonstrate the use of organic ligands other than dimethoxyethane (glyme) in the procedure of Example 1, while Examples 18 and 19 illustrate alternative ways in which the organic ligand may be utilized in the process of D3, e.g. by repeating the procedure of Example 1 with dimethoxyethane being present in the potassium hexacyanocobaltate solution prior to addition of the zinc chloride solution (Example 18). In Example 19, all of the dimethoxyethane is present initially in the potassiumhexacyanocobaltate solution.

No similar comparative examples have been carried out on Comparative Example 6.

8.3.6 Therefore, D3 does not directly and unambiguously disclose a method with all the features as defined in Claim 1 of the Third Auxiliary Request in combination.

8.4 Other documents have not been invoked against novelty by the respondents during the appeal proceedings. The Board has no reason to take a different position.

8.5 It follows from the above that the method defined in Claim 1 of Third Auxiliary Request is novel.

9. *Remittal*

9.1 The sole ground for revocation in the decision under appeal was the lack of novelty of the claimed subject-matter of the sole request before the Opposition Division, corresponding identically to the Main Request in the present appeal proceedings, having regard to D8. Hence, inventive step was not dealt with in the decision under appeal.

9.2 The parties have requested remittal if novelty were acknowledged, which is the case for the claims of the Third Auxiliary Request.

9.3 The Board, in the exercise of its discretion under Article 111(1) EPC, considers it appropriate to remit the case to the first instance for further prosecution.

**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 for further prosecution on the basis of the claims of the Third Auxiliary Request filed on 29 April 2009.

The Registrar:

The Chairman:

S. Fabiani

S. Perryman