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Datasheet for the decision of 16 January 2024

Case Number: T 1167/22 - 3.3.05

Application Number: 14887437.3

Publication Number: 3085667

IPC: C01G25/00, C01G25/02

Language of the proceedings: EN

Title of invention:
ZIRCONIA-BASED POROUS BODY AND METHOD FOR PRODUCING SAME

Patent Proprietor:
Daiichi Kigenso Kagaku Kogyo Co., Ltd.

Opponent:
Neo Chemicals & Oxides (Europe) Ltd.

Headword:
Zirconia-based porous body/DAIICHI

Relevant legal provisions:
EPC Art. 56, 83, 84
EPC R. 139
RPBA 2020 Art. 12(4), 12(6), 13(2)

Keyword:
Late-filed evidence - should have been submitted in first-instance proceedings (yes) - circumstances of appeal case justify admittance (yes)
Amendment after summons - cogent reasons (no)
Sufficiency of disclosure - (yes)
Claims - product-by-process claims - clarity - main request (yes)
Inventive step - main request (yes) - non-obvious solution

Decisions cited:
G 0003/14, T 1305/15, T 3272/19

Catchword:

Europäisches Patentamt
European Patent Office
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Beschwerdekammern

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Case Number: T 1167/22 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 16 January 2024

Appellant: (Opponent)	Neo Chemicals & Oxides (Europe) Ltd. c/o Tmf Group, 8th Floor 20 Farringdon Street London EC4A 4AB (GB)
Representative:	Bird & Bird LLP Maximiliansplatz 22 80333 München (DE)
Respondent: (Patent Proprietor)	Daiichi Kigenso Kagaku Kogyo Co., Ltd. 4-4-9, Kitahama Chuo-ku Osaka-shi, Osaka 541-0041 (JP)
Representative:	Kraus & Lederer PartGmbB Thomas-Wimmer-Ring 15 80539 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 March 2022 rejecting the opposition filed against European patent No. 3085667 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	E. Bendl
Members:	T. Burkhardt
	O. Loizou

Summary of Facts and Submissions

I. The opponent's (appellant's) appeal is against the opposition division's decision to reject the opposition against European patent No. 3 085 667 B1.

II. The following documents were among those discussed at the opposition stage:

D1f Pore size distribution curve
D3 US 2013/0142713 A1
D3a S. H. Ng, "Experimental Report US2013/0142713 Example 1", 6 December 2021
D4 US 2008/0187476 A1
D4a S. H. Ng, "Experimental Report", 17 April 2018
D4b "Porogram of the pore volume measurement described in D4b"
D5 EP 1 621 251 A1
D6 EP 1 894 620 A1
D7 L. G. Joyner *et al.*, "The Determination of Pore Volume and Area Distributions in Porous Substances. II. Comparison between Nitrogen Isotherm and Mercury Porosimeter Methods", J. Am. Chem. Soc., 73, 7, 1951, 3155–8
D8 B. D. Adkins and B. H. Davis, "Comparison of Nitrogen Adsorption and Mercury Penetration Results: I. Pore Volume and Surface Area Obtained for Type IV Isotherms", Adsorption Science & Technology, 5(1), 1988, 76-93
D9 EP 2 108 621 A1

III. With its statement setting out the grounds of appeal, the appellant submitted the following documents:

D13 Declaration "Expert statement concerning the parameter P/W in EP 3 085 667 B1" by F. Schüth dated 17 July 2022

D14 US 2021/0071558 A1

IV. With its reply to the statement setting out the grounds of appeal, the patent proprietor (respondent) submitted the following document:

D15 Declaration by H. Kodama dated 21 November 2022

V. The independent claims of the main request (submitted as auxiliary request 1 with the reply to the appeal) read as follows:

"1. A method for producing a zirconia-based porous body in the form of particles,

(1) the zirconia-based porous body having a pore diameter peak at 20 to 100 nm in the pore diameter distribution by BJH method, a P/W ratio of 0.05 or more wherein W represents half width of the peak and P represents height of the peak in the measured pore distribution curve, and a total pore volume of 0.5 cm^3/g or more; and
(2) the zirconia-based porous body having a pore diameter peak at 20 to 100 nm, the P/W ratio of 0.03 or more, a specific surface area of at least 40 m^2/g, and a total pore volume of 0.3 cm^3/g or more, after heat treatment at 1000°C for 12 hours,

the method sequentially comprising the following steps:

(1) separately heating a zirconium salt solution and a solution of sulfatizing agent to 95°C or higher;

(2) mixing the zirconium salt solution after heating and the solution of sulfatizing agent after heating to obtain a basic zirconium sulfate-containing reaction liquid as a liquid mixture, wherein, from initiation to completion of the mixing, the weight ratio of SO_4^{2-}/ZrO_2 in the liquid mixture is maintained within a range of 0.3 to 0.8, and the temperature of the liquid mixture is maintained at 95°C or higher;

(3) aging the basic zirconium sulfate-containing reaction liquid obtained by completing the mixing in step 2, the aging being performed at 95°C or higher for 3 hours or more;

(4) adding an alkali to the basic zirconium sulfate-containing reaction liquid obtained after aging in step 3 to obtain a zirconium-containing hydroxide; and

(5) subjecting the zirconium-containing hydroxide obtained in step 4 to heat treatment to obtain a zirconia-based porous body."

"3. A zirconia-based porous body, obtainable by the process of claim 1."

Dependent claims 2 and 4 to 6 are embodiments.

VI. The appellant's arguments at the appeal stage relevant to the present decision can be summarised as follows.

While documents D13 and D14 were to be admitted in line with T 3272/19, document D15 was to be disregarded since the requirements of Rule 139 EPC were not met.

Neither several open ranges nor the P/W ratio parameter of claim 1 of the main request met the requirements of Article 83 EPC. In this regard, T 1305/19 was to be followed.

The product-by-process feature in product claim 3 of the main request did not meet the requirements of Article 84 EPC.

The subject-matter of method claim 1 of the main request was not inventive in view of D5.

The subject-matter of the product claim 3 of the main request was not inventive in view of each of D3, D4 and D5.

VII. The respondent's arguments at the appeal stage are reflected in the reasons below.

VIII. The appellant requested that the decision under appeal be set aside and the patent be revoked.

The respondent requested that the patent be maintained in amended form on the basis of the main request, submitted as auxiliary request 1 with the reply to the appeal, alternatively, that the patent be maintained in amended form on the basis of auxiliary request 2 submitted with the reply to the appeal.

Reasons for the Decision

1. Consideration of documents

1.1 Documents **D13** and **D14**

In the appellant's view, D13 and D14 were to be admitted. Their submission at the beginning of the appeal proceedings was a reaction to the fact that, contrary to the communication attached to the summons to the oral proceedings at the opposition stage, the decision under appeal referred to the pore diameter range between 20 and 100 nm indicated in claim 1 when declaring that there was no evidence for overlapping peaks. D13 and D14 were highly relevant in this regard. The appellant was of the opinion that T 3272/19 supported its view.

However, in the communication attached to the summons to the oral proceedings at the opposition stage, the opposition division indicated that the way to determine the P/W ratio appeared sufficiently disclosed (point B. 2.3). There was no evidence for the presence of overlapping peaks (last paragraph of point B.2.2.2 and the third bullet point of point B.2.2.3).

Contrary to the appellant's view, it could not come as a surprise that this remark concerned more particularly the presence of overlapping peaks in the relevant pore size range between 20 and 100 nm of claim 1 as granted, which is the same range as in claim 1 of the current main request.

The situation in T 3272/19 dated 11 February 2021 (see point 1.1.3 of the Reasons) was different. The

additional document filed in that case at the beginning of the appeal stage consisted of a single table, whereas document D13 in the case at hand is a six-page expert declaration dealing with various facets of the Article 83 EPC objection against the P/W ratio parameter as well as its relevance for inventive step, and D14 is a patent document. The additional document in T 3272/19 was submitted as a reaction to a new aspect in the decision which had not been discussed in the summons to oral proceedings at the opposition stage.

Therefore, D13 and D14 should have been submitted at the opposition stage and are disregarded (Article 12(4) and 12(6) RPBA 2020) in the appeal proceedings.

1.2 Document **D15**

Declaration D15 submitted by the respondent with its reply explains that the amount of aqueous zirconium oxychloride solution in paragraph [0101] and the reference to "Comparative Example 1" in paragraph [0106] of the patent in suit were typographical errors (points 7 and 8).

In the appellant's opinion, D15 was not to be admitted. The declaration merely contained assertions that were not based on elements like a lab book. The conditions for a correction under Rule 139 EPC were also not met.

These argument are not convincing. The respondent's submission of D15 is a reaction to the oral proceedings at the opposition stage, where the appellant, for the first time, pointed to the fact that Example 1 and Comparative Example 1 of the patent in suit as well as Example 2 and Comparative Example 2 resulted in the

same final compositions in spite of different amounts of aqueous zirconium oxychloride solution (see Table 1; paragraphs [0075], [0101] and [0106]).

The respondent does not request a correction of the patent under Rule 139 EPC. Under these circumstances, the submission of D15 is similar to the submission of post-published evidence. The criteria of Rule 139 EPC are therefore irrelevant.

D15 is therefore admitted into the appeal proceedings (Article 12(4) RPBA 2020).

Main request

The main request corresponds to auxiliary request 1 submitted with the reply to the appeal.

Compared with the claims as granted, the order of the claims of the main request has been inverted. Claim 1 now refers to the production method; claim 3, to the product.

Moreover, the structural features of the product of claim 1 of the patent as granted have been spelled out in method claim 1, and the product-by-process features corresponding to claim 5 of the patent as granted have been inserted into product claim 3.

2. Sufficiency of disclosure

With regard to the claims as granted, the appellant objects under Article 83 EPC to the presence of several

open ranges in product claims 1 and 2 and to the P/W ratio in claim 1.

In the appellant's view, these objections also apply to the main request.

However, for the reasons set out below, the requirements of Article 83 EPC are met.

2.1 Open-ended ranges

With regard to the claims as granted, the appellant objected to the open-ended ranges in product claims 1 and 2 that relate to the:
- total pore volume before calcination
- total pore volume after calcination
- specific surface area after heat treatment at 1 000°C
- specific surface area after heat treatment at 1 100°C

In its view, these ranges encompassed parameter values well above those disclosed in the patent in suit and were not implicitly limited by other features of claim 1. This went beyond the technical contribution of the disclosure. This objection also applied to the main request.

This argument is not convincing since, in contrast to product claim 1 of the patent as granted, product claim 3 of the main request *is* implicitly limited by the inserted product-by-process feature "obtainable by the process of claim 1". Thus, claim 3 specifies that the zirconia-based body has to be obtainable by a process involving method steps (1) to (5) of process claim 1.

This reasoning also applies to dependent claim 4.

Consequently, the open-ended ranges in claims 3 and 4 meet the requirements of Article 83 EPC.

2.2 Ratio of the height of the peak to the half width of the peak ("P/W ratio")

2.2.1 The appellant put forward the following reasons why the P/W ratio required by product claim 3 (via the reference to method claim 1) did not meet the requirements of Article 83 EPC.

(a) In the patent in suit, there was no indication of the minimum number of points of the isotherm to be evaluated when determining the P/W ratio with the Barret, Joyner and Halenda (BJH) method.

This number had a high impact on the result, as could be seen from Figure 1 of the patent in suit. The determination of each point of the isotherm with the BJH method was time consuming. Yet, there was no guidance in the patent in suit on how to strike a balance between accuracy and the minimum number of data points. There was also an apparent inconsistency between the peak of Example 2 in Figure 1 of the patent in suit and the data of Table 2. Since this peak had the smallest width in Figure 1 (due to the logarithmic scale of the pore diameter), it should have the highest P/W ratio of all the inventive examples. However, according to Table 2, its P/W ratio was the smallest of all the inventive examples.

(b) There was also no indication whether the adsorption or desorption isotherm was to be used. Yet, the results depended on this choice.

(c) It was unclear how the P/W ratio was to be determined in case of overlapping peaks in the isotherm.

For insufficiency of disclosure, two conditions had to be met for raising serious doubts in the appellant's view.
(i) There had to be an indication that overlapping peaks in the claimed pore size range were possible.
(ii) The P/W ratio could not be determined in this event.

The appellant held that the balance of probabilities was sufficient and pointed, *inter alia,* to **D4** (Example 6 and Figure 1) and **D5** (Figure 1). In the relevant pore size region, mercury porosimetry and the BJH method yielded comparable results as shown by **D7** (page 3158, right column) and **D8** (Table 2 on page 88, first paragraph on page 92).

(d) The P/W ratio had no unit of measurement.

(e) The Micromeritics FlowSorb II apparatus mentioned in paragraph [0068] of the patent in suit could not determine the P/W ratio.

Moreover, the P/W ratio was an unusual parameter. Since these issues related to a parameter that was crucial for solving the problem underlying the invention, the skilled person trying to carry out the invention could not know whether the problem was solved. Hence, in line with T 1305/15, the requirements of Article 83 EPC were not met.

2.2.2 However, these arguments are not convincing for the reasons set out below.

Generally, Figure 1 and Table 2 of the patent show that it was possible to determine the P/W ratio for the experiments of the patent before calcination. Table 3 shows that this was also possible after calcination. Paragraph [0069] indicates a suitable apparatus.

In addition, documents D1f and D3a (see the table on page 2) prove that the appellant succeeded in determining the P/W ratio at least in these cases.

The appellant has moreover only provided allegations that the effects of issues (a) to (e) mentioned above are such that they permeate the whole claim and not only affect its edges.

Specifically, the board notes the following.

- With regard to objection (a), it is clear from Figure 1 of the patent in suit that the number of data points has an influence on the P/W ratio. However, for any measurement, a balance has to be struck between accuracy and effort. The skilled person would choose a sufficiently high number of data points to determine the P/W ratio. It has not been shown that any ambiguity in the determination of the P/W ratio due to the number of data points does not only affect the edges of the claimed subject-matter.

As an aside, clarity cannot be discussed since the feature already appears in the claims as granted (G 3/14, OJ 2015, 102, catchword).

The allegation of fact on Example 2 of the patent in suit and the comparison between Figure 1 and Table 2, according to which the peak with the smallest width

could not have the smallest P/W ratio, was only raised at the oral proceedings. The appellant did not indicate any exceptional circumstances justified by cogent reasons for raising this issue at this stage of the appeal proceedings, and the board cannot identify such reasons either. This allegation of fact is therefore not taken into account (Article 13(2) RPBA 2020).

- The admissibility of objection (b) notwithstanding, the appellant provided no evidence to show that the choice of the adsorption or desorption isotherm not only affects the edges of the claimed area.

- With regard to objection (c), there is no admissible evidence on file that shows that overlapping peaks in the claimed pore size range (determined by the BJH method) for zirconia-based porous bodies are possible, let alone for zirconia-based porous bodies produced in accordance with method steps (1) to (5) of claim 1.

In **D4**, Hg porosimetry is used instead of the BJH method (paragraph [0024]; see also page 2 of **D4a** and the porogram of **D4b**). For the following reasons, these methods do not *necessarily* yield comparable results under the current circumstances.
- The conclusions drawn in **D7** from a pore radius range between 0 and 30 nm (between 0 and 300 Å) in the right-hand column of page 3158 cannot necessarily be extrapolated to the entire relevant pore diameter range between 20 and 100 nm of the case at hand.
- **D8** does not indicate that the BJH method was used for the comparison of Table 2 on page 88.
- **D11** (page 190) and **D12** (page 1319, left-hand column) indicate that compression of the porous silica caused by the mercury may cause different results from nitrogen sorption. Coherently, **D11** indicates a "good

correlation" between both methods only for "low pore volume samples" but "large discrepancies" for "high pore volume silicas" (page 187, left-hand column). No reason can be seen why such compressibility effects should not occur with zirconia.

Consequently, no conclusions as to the presence of overlapping peaks in the relevant pore size range can be drawn from Example 6/Figure 1 of D4.

The question of the method of measurement notwithstanding, already in the notice of opposition, the appellant showed that it could rework Example 6 of D4 and determine the P/W ratio with three-digit precision for the peak in the claimed pore size range, i.e. at 60 nm (see points 74 to 79 of the notice of opposition, D4a and D4b). The appellant confirmed this finding in the statement setting out the grounds of appeal (points 111 to 116).

In this vein, the appellant indicated three possible half widths W that could be determined from the peak at 60 nm of Figure 1 of D4, namely 50 nm, 70 nm and 300 nm. It has not been contested, however, that all these half widths result in P/W ratios below the claimed range.

The peak at 12 nm in Figure 1 of D4 is of less relevance since it is below the claimed pore size range. Yet, even for this peak, the appellant was able to determine a P/W ratio with three-digit precision (statement setting out the grounds of appeal, point 111).

The "Present Invention 1" curve in Figure 1 of **D5** does not show significantly overlapping peaks in the range

between 20 and 100 nm (i.e. 200 to 1 000 Å) either. The peak on the right at around 50 nm (500 Å) is clearly defined. There is no evidence that the P/W ratio for this peak cannot be determined. The peak on the left at around 10 nm (100 Å), 15 nm according to Table 2, is below the range of claim 1.

- With regard to objection (d), the overall teaching of the patent in suit, in particular Figure 6 as well as Tables 2 and 3, indicates the units to be used when determining the P/W ratio.

- The admissibility of objection (e) notwithstanding, the skilled person would understand that the apparatus for determining the BET surface, namely FlowSorb II by Micromeritics Corp., is not suitable for determining the porosity, as erroneously stated in paragraph [0068] of the patent in suit. They would hence understand that the last sentence of paragraph [0068] belongs to subsequent paragraph [0069] instead, which deals with the measurement of the pore diameter and volume by a specific apparatus.

The case at hand is also not comparable to T 1305/15, where an embedding of the outer side of a claimed membrane (the embedding being applied for measurement) had such an influence on the measurement of the claimed parameter (namely the "zeta potential on the inner surface [of the membrane]") that "an extensive research programme" was required for its selection (Reasons 4.12 and 4.17). In the case at hand, the board does not see any influence of an external entity to the extent of the embedding in T 1305/15.

Consequently, the P/W ratio in method claim 1 and product claim 3 does not violate the requirements of Article 83 EPC.

3. Clarity

The appellant argued that the newly inserted product-by-process feature rendered claim 3 unclear since a definition only by structural features would have been possible, i.e. by means of upper limits of the open ranges.

This is not convincing. The product-by-process feature implicitly clarifies which areas and pore volumes are encompassed by the claim.

In the case at hand, the indication of upper limits would be an undue restriction of the subject-matter to be protected since it is credible that these limits would depend on the composition of the porous body, for example.

The main request therefore meets the requirements of Article 84 EPC.

4. Inventive step

The appellant has raised inventive-step objections starting from:
- each of D3 and D4 against the subject-matter of product claim 3
- D5 against the subject-matter of claims 3 and 1

4.1 Product claim 3: **D3**

4.1.1 The invention is a zirconia-based porous body.

4.1.2 The mixed oxide of Example 1 of D3 is zirconia-based; has a total pore volume of 1.8 cm^3/g after a calcination of 4 h at 900°C (Table 2), albeit determined by Hg porosimetry; and a specific surface area of 48.3 m^2/g after a calcination of 4 h at 1 000°C (Table 1). A porogram is shown in Figure 1.

According to a re-working of this example by the appellant (see document **D3a**), the specific surface area did not decrease further after a longer calcination at 1 000°C for 12 h, and the total pore volumes before and after calcination according to the BJH method are in the claimed ranges. By contrast, the P/W ratios of 0.032 and 0.023 (before and after calcination respectively, see the table on page 2 of D3a) are below the minimum values required by claim 3 (through the reference back to method claim 1).

4.1.3 According to the patent in suit, the problem to be posed is the provision of a zirconia-based porous body with improved heat resistance maintaining a high specific surface area and total pore volume even after heating for a long time (paragraphs [0015] and [0028] of the patent in suit).

4.1.4 The proposed solution to this problem is the zirconia-based porous body of claim 3 characterised at least by P/W ratios before and after calcination above specific thresholds (which are required via the reference to claim 1).

4.1.5 For the reasons set out below, the technical problem has been successfully solved.

Table 4 of the patent in suit confirms that inventive Examples 1 to 4 with P/W ratios before and after calcination within the claimed ranges have a higher specific surface area after a calcination of 12 h at 1 100°C than Comparative Examples 1 and 2. This indicates improved thermal stability after calcination.

The appellant alleges that Table 4 could not prove an improvement since Example 1 and Comparative Example 1 of the patent in suit resulted in the same final composition in spite of different amounts of aqueous zirconium oxychloride solution (see Table 1 as well as paragraphs [0075] and [0101]). Similarly, Comparative Example 2 was not comparable to Example 2 since this sample was obtained, according to paragraph [0106], as in Comparative Example 1, i.e. with different amounts of zirconium dioxide.

Confronted with these objections at the oral proceedings at the opposition stage, the respondent could only argue that the operating conditions had been adapted to obtain the same final composition in spite of the different amounts of aqueous zirconium oxychloride solution.

At the appeal stage, after having duly consulted the responsible technical expert, the respondent presents a different explanation. **D15** indicates that the amount of aqueous zirconium oxychloride solution in Comparative Example 1 of the patent in suit (paragraph [0101]) was a typographical error (point 7). The correct amount was 450 g, just as in Example 1. The reference in paragraph [0106] to "Comparative Example 1" only meant the

reaction conditions, not the amount of zirconium dioxide, which was the same as in Example 2. This was also logical since the examples were meant to allow for a meaningful comparison. Consequently, Example 1 and Comparative Example 1 were comparable, just as Example 2 and Comparative Example 2 were.

While these statements by the respondent are not supported by any further explanations or evidence, the board cannot identify a contradiction between the explanations provided by the respondent and the remaining information in the patent in suit. The board also observes that the examples were meant to be comparative. Importantly, the appellant has failed to submit any experimental evidence showing that the rectified amounts of aqueous zirconium oxychloride solution do not yield the results of Tables 1 to 4 of the patent in suit.

The appellant also puts forward that if there were a correlation between the claimed P/W ratio and the surface area after calcination at 1 100°C:
- the examples of the patent in suit with the highest P/W ratio should also have the highest surface area after calcination and vice versa
- the examples of the patent in suit with the highest (relative) decrease in surface area should have the lowest P/W ratio

However, this was not the case since:
- Example 3 had the highest P/W ratio of the inventive examples before and after heat treatment but the lowest specific surface area after calcination at 1 100°C (Tables 2 to 4)
- Comparative Example 2 had the lowest P/W ratio before and after the heat treatment but a higher specific

surface area after calcination at 1 100°C than Comparative Example 1

There was thus no direct correlation in the appellant's view.

This argument is not convincing. What is important is that zirconia-based porous bodies as claimed show improved thermal stability, i.e. a higher surface area after calcination, when compared with bodies not according to the invention. It is not necessary that, within the claimed ranges, the thermal stability/ surface area after calcination at 1 100°C increase with increasing P/W ratios in a steady manner. Besides, Example 3 has a different chemical composition (see Table 1). Hence, its results cannot be directly compared to those of inventive and Comparative Examples 1 and 2.

Hence, there is no evidence on file to show that the problem has not been successfully solved by the zirconia-based porous body of claim 3.

4.1.6 It has not been disputed that there is no incentive in the available prior art to choose a P/W ratio before and after calcination within the claimed ranges to improve thermal stability after calcination.

An inventive step is hence acknowledged (Article 56 EPC).

4.2 Product claim 3: **D4**

4.2.1 The appellant alternatively refers to Example 6 and Figure 1 of D4 as the closest prior art. It also refers

to its re-working of this example (see documents D4a and D4b).

It has not been disputed that D4 fails to disclose the P/W ratio after the calcination required by claim 3.

4.2.2 Consequently, the reasoning above on D3 also applies to D4, and an inventive step is acknowledged (Article 56 EPC).

4.3 Method claim 1: **D5**

4.3.1 Claim 1 is a method for producing the zirconia-based porous body found to involve an inventive step above under points 4.1 and 4.2.

Claim 1 requires the same P/W ratios before and after calcination as product claim 3.

4.3.2 It is undisputed that D5 fails to explicitly disclose P/W ratios in the range of claim 1.

The appellant also acknowledges that D5 requires a mixing temperature of at least 80°C but less than 95°C (e.g. claim 10 or paragraph [0045]), whereas claim 1 specifies mixing at 95°C or higher.

The patent in suit explains that, *inter alia*, the temperature of the liquid mixture plays a role for obtaining the desired properties (paragraphs [0015] and [0016]). The mixing temperature is at least one of the parameters that distinguish the preparation of the inventive Examples 1 and 2 from the preparation of the Comparative Examples 1 and 2 (paragraphs [0101] and [0106] in combination with point 8 of D15).

At least for this reason, P/W ratios in the claimed range are not implied by the preparation method of D5 either. The appellant has failed to submit any counter-evidence to this.

Whether there are further differences between the preparation methods of inventive Examples 1 and 2, on the one hand, and Comparative Examples 1 and 2 of the patent in suit, on the other hand, such as a longer mixing time and/or an additional heating step, is of no relevance for this conclusion.

For the reasons indicated above for claim 3 and since neither **D5** nor **D6** or **D9** suggest adapting the mixing temperature to modify the P/W ratio to improve the thermal stability after calcination, the subject-matter of claim 1 also involves an inventive step (Article 56 EPC).

4.4 Product claim 3: **D5**

This objection was only raised after the initial appeal phase. Admittance under Article 13(1) RPBA of this objection notwithstanding, it cannot succeed for the reasons set out above under points 4.1, 4.2 and 4.3.

4.5 For the same reasons, the subject-matter of the dependent claims also involves an inventive step.

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 in amended form on the basis of the set of claims of the main request, previously filed with the reply to the appeal as auxiliary request 1, and a description to be adapted if needed.

The Registrar: The Chairman:

C. Vodz E. Bendl

Decision electronically authenticated