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**Datasheet for the decision  
of 8 December 2016**

**Case Number:** T 0964/13 - 3.3.03

**Application Number:** 07121917.4

**Publication Number:** 1890147

**IPC:** G01N33/543

**Language of the proceedings:** EN

**Title of invention:**

Organic polymer particles and process for producing the same,  
magnetic particles for diagnostics, carboxyl group-containing  
particles and process for producing the same, and probe-bound  
particles and process for producing the same

**Patent Proprietor:**

JSR Corporation

**Opponent:**

Life Technologies Corporation

**Headword:**

**Relevant legal provisions:**

EPC Art. 54, 56, 123(2)

RPBA Art. 13(1)

**Keyword:**

Novelty - (main request and auxiliary request 1) (no)  
Inventive step - (auxiliary requests 5 and 6) (no)  
Amendments - extension beyond the content of the application  
as filed (auxiliary requests 2, 3, 4, 4A and 7) (yes)  
Late-filed request - justification for late filing (auxiliary  
requests 1A and 3A) (no)  
Late-filed document - admitted (yes)

**Decisions cited:**

G 0009/91, T 0585/92, T 0482/07, T 1732/10

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 0964/13 - 3.3.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.03**  
**of 8 December 2016 2016**

**Appellant:** JSR Corporation  
(Patent Proprietor) 5-6-10, Tsukiji,  
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**Representative:** TBK  
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**Appellant:** Life Technologies Corporation  
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**Representative:** Atkinson, Jonathan David Mark  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
22 February 2013 concerning maintenance of the  
European Patent No. 1890147 in amended form.**

**Composition of the Board:**

**Chairman** F. Rousseau  
**Members:** O. Dury  
R. Cramer

## Summary of Facts and Submissions

I. The appeals by the patent proprietor and the opponent lie from the interlocutory decision of the opposition division maintaining patent EP 1 890 147 in amended form according to auxiliary request B filed during the oral proceedings of 23 January 2013. The opposed patent is based on application No. 07 121 917.4 (divisional application of the earlier application No. 06 122 165.1 and claiming five priorities between 1 November 2005 and 27 March 2006).

II. The claims of the application as filed which are relevant to the present decision read as follows:

"1. Organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group."

"2. The organic polymer particles as defined in claim 1, comprising superparamagnetic fine particles."

"3. The organic polymer particles as defined in claim 2, further comprising:

nuclear particles;

a magnetic material layer containing the superparamagnetic fine particles and provided in the outer layer of the nuclear particles; and

a polymer part having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group, and provided in the outer layer of the magnetic material layer."

"4. Organic polymer particles for probe-binding having a hydroxyl group originating from a 2,3-dihydroxypropyl group, a polyoxyethylene group, and a tosyl group."

"9. A process for producing organic polymer particles comprising binding a modifier (M) having a polyoxyethylene group with organic polymer particles having a 2,3-dihydroxypropyl group."

III. Claim 1 of the granted patent was identical to claim 1 as originally filed.

IV. The patent was opposed in its entirety on the grounds of Article 100(a) EPC (lack of novelty and of an inventive step) and Article 100(b) EPC.

V. The following documents were *inter alia* referred to in the contested decision:

D1: WO 2005 015216

D1A: Chemistry of Example 16 of D1 (2 pages)

D1b: Chemistry of Examples 16, 17 and 19 of D1  
(5 pages)

D1c: Mechanism of hydrolysis of a terminal epoxide  
under neutral conditions (1 page)

D2: JP 2005-232237 (PAJ abstract)

D2a, D2b: automatic and human translations of D2

D3: EP-A-1 617 220

D3a: Chemistry of selected synthetic examples of D3  
(4 pages)

D9: P. Paseiro et al., J. Agric. Food Chem. (1997),  
45, 3493-3500

D10: D. Horak and P. Shapoval, J. Pol. Sci.: Part  
A: Polymer Chemistry (2000), Vol. 38,  
3855-3863

VI. The contested decision was based on the patent as granted (main request) and on auxiliary requests A and B submitted during the oral proceedings.

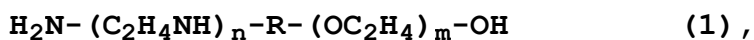
Claim 2 of auxiliary request A read as follows  
(additions as compared to original claim 3 are  
indicated in **bold**, deletions in ~~strikethrough~~):

"2. ~~The Organic polymer particles as defined in claim 2~~  
**for probe binding**, ~~further~~ comprising:  
nuclear particles;  
a magnetic material layer containing the  
superparamagnetic fine particles and provided in the  
outer layer of the nuclear particles; and  
a polymer part having ~~a hydroxyl group originating~~  
~~from~~ a 2,3-dihydroxypropyl group, ~~and~~ a polyoxyethylene  
group, **and a tosyl group**, and provided in the outer  
layer of the magnetic material layer."

Claim 1 of auxiliary request B read as follows  
(additions as compared to original claim 1 are  
indicated in **bold**):

"1. Organic polymer particles having a hydroxyl group  
originating from a 2,3-dihydroxypropyl group and a  
polyoxyethylene group,

**the organic polymer particles being obtainable by a  
method of introducing a carboxyl group into organic  
polymer particles having a hydroxyl group originating  
from a 2,3-dihydroxypropyl group and coulomb binding  
the carboxyl group with the amino group of the  
modifier (M) of the following formula (1)**



**wherein n=2 to 20, m=2 to 200, and R is a divalent  
hydrocarbon group."**

According to that decision granted claim 1 was held to be anticipated by each of example 19 of D1, example 10 of D2 and examples 16 and 19 of D3. Claim 2 of auxiliary request A was considered to infringe the requirements of Article 123(2) EPC. However, the patent in amended form according to auxiliary request B filed during the oral proceedings of 23 January 2013 was considered to satisfy the requirements of Article 123(2)(3) EPC, Article 84 EPC, Article 83 EPC, Article 54 EPC and Article 56 EPC. An inventive step was in particular acknowledged starting from D3 as closest prior art.

VII. The opponent (appellant 1) lodged an appeal against the above decision and requested in its statement of grounds of appeal that the decision of the opposition division be set aside and the patent be revoked. The following document was *inter alia* also simultaneously filed:

D15: Illustration of the Chemistry of  
Examples 5 and 6 of D1 (5 pages)

VIII. The patent proprietor (appellant 2) lodged an appeal against the above decision. In its statement of grounds of appeal the patent proprietor requested that the decision of the opposition division be set aside and the patent be maintained as granted (main request) or, in the alternative, that it be maintained in amended form on the basis of any of four auxiliary requests filed therewith.

IX. With letters of 8 November 2013 and 7 April 2014 the opponent submitted new arguments and filed additional documents D17 and D1d, respectively:

D17: EP-A-1 650 565

D1d: Illustration of the Chemistry of Examples 5  
and 6 of D1

- X. With letters of 4 November 2013, 18 March 2014 and 17 July 2014 the patent proprietor submitted new arguments and various sets of auxiliary requests.
- XI. With letter of 14 December 2015 the parties were summoned to oral proceedings to be held on 26 July 2016.
- XII. The opponent submitted further arguments with letter of 26 April 2016.
- XIII. With letter of 10 June 2016 the patent proprietor submitted new arguments.
- XIV. In a communication issued by the Board on 17 June 2016, issues to be discussed at the oral proceedings were specified.
- XV. With letter of 19 July 2016 the patent proprietor submitted further arguments as well as two new auxiliary requests (1A and 3A) and reordered the sequence in which its auxiliary requests were to be dealt with.
- XVI. During the oral proceedings held before the Board in the presence of both parties the operative requests defended by the patent proprietor were as follows (in that order):
- main request: patent as granted;
  - auxiliary request 3 filed with letter of 4 November 2013;



- auxiliary request 3A filed with letter of 19 July 2016;
- auxiliary request 1 filed with letter of 4 November 2013;
- auxiliary request 1A filed with letter of 19 July 2016;
- auxiliary requests 2 and 4 filed with letter of 4 November 2013;
- auxiliary request 4A filed with letter of 18 March 2014;
- auxiliary request 5, which corresponds to auxiliary request B on which the contested decision is based;
- auxiliary requests 6-7 filed with letter of 4 November 2013.

Claim 2 of auxiliary request 3 only differed from claim 2 of auxiliary request A on which the contested decision is based (see section VI) in that the term "the" before "superparamagnetic" was deleted.

Claim 1 of auxiliary request 3A read as follows:

"1. A process for producing organic polymer particles comprising:

nuclear particles;

a magnetic material layer containing superparamagnetic fine particles and provided in the outer layer of the nuclear particles; and

a polymer part having a 2,3-dihydroxypropyl group and a polyoxyethylene group, and provided in the outer layer of the magnetic material layer,

the process comprising binding a modifier (M) having a polyoxyethylene group with organic polymer particles having a 2,3-dihydroxypropyl group."

Claim 1 of auxiliary request 1 read as follows:

"1. Organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group,

wherein the polyoxyethylene group is represented by  $H-(O-CH_2-CH_2-)_n-O-$ , wherein n is an integer of 2 or more,

wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles."

Claim 1 of auxiliary request 1A read as follows:

"1. A process for producing organic polymer particles comprising binding a modifier (M) having a polyoxyethylene group with organic polymer particles having a 2,3-dihydroxypropyl group,

wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles and

wherein the polyoxyethylene group is represented by  $H-(O-CH_2-CH_2-)_n-O-$ , wherein n is an integer of 2 or more."

Claim 1 of auxiliary request 2 read as follows  
(additions as compared to original claim 1 are indicated in **bold**):

"1. Organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a

polyoxyethylene group,

wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles,

the organic polymer particles being obtainable by a process comprising binding a modifier (M) with organic polymer particles to produce the polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group,

wherein the modifier (M) is represented by the following formula (1)



wherein  $n=2$  to 20,  $m=2$  to 200, and R is a divalent hydrocarbon group."

Claim 1 of auxiliary request 4 read as follows:

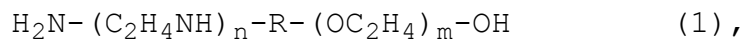
"1. Organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group,

wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles,

the organic polymer particles being obtainable by a process comprising coulomb binding or amide binding a modifier (M) with organic polymer particles having a 2,3-dihydroxypropyl group,

wherein the modifier (M) is represented by the

following formula (1)



wherein,  $n=2$  to  $20$ ,  $m=2$  to  $200$ , and R is a divalent hydrocarbon group."

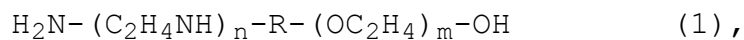
Claim 1 of auxiliary request 4A read as follows:

"1. Use of organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group for probe binding,

wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles,

the organic polymer particles being obtainable by a process comprising coulomb binding or amide binding a modifier (M) with organic polymer particles having a 2,3-dihydroxypropyl group,

wherein the modifier (M) is represented by the following formula (1)



wherein,  $n=2$  to  $20$ ,  $m=2$  to  $200$ , and R is a divalent hydrocarbon group."

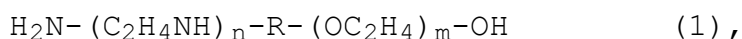
Claim 1 of auxiliary request 5 is identical to claim 1 of auxiliary request B submitted during the oral proceedings before the opposition division, the wording of which is indicated in section VI above.

Claim 1 of auxiliary request 6 read as follows:

"1. Organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group,

wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles,

the organic polymer particles being obtainable by a method of introducing a carboxyl group into organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and coulomb binding the carboxyl group with the amino of the group modifier (M) of the following formula (1)



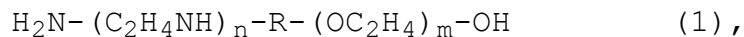
wherein,  $n=2$  to  $20$ ,  $m=2$  to  $200$ , and R is a divalent hydrocarbon group."

Claim 1 of auxiliary request 7 read as follows:

"1. Organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group,

wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles,

the organic polymer particles being obtainable by a method of introducing a carboxyl group into organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and coulomb binding the carboxyl group with the amino of the group modifier (M) of the following formula (1)



wherein,  $n=2$  to  $20$ ,  $m=2$  to  $200$ , and R is a divalent hydrocarbon group,

the organic polymer particles further comprising:  
nuclear particles;

a magnetic material layer containing the superparamagnetic fine particles and provided in the outer layer of the nuclear particles; and

a polymer part having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group, and provided in the outer layer of the magnetic material layer."

XVII. During the oral proceedings before the Board both parties withdrew their requests of apportionment of costs previously made in writing.

XVIII. The patent proprietor's arguments, as far as relevant to the present decision, may be summarised as follows:

**Main request (granted patent) - Novelty**

(a) Only the PCT application corresponding to D3 was a valid prior art under Article 54(2) EPC. There was no evidence on file that the particles prepared in examples 16 and 19 of D3 were hydrolysed at all. Since D9 was not related to polymeric particles, no conclusion could be drawn therefrom in relation to examples 16 and 19 of D3. Since D10 was related to polymeric particles made from homopolymers of glycidyl methacrylate and not to copolymers as in examples 16 and 19 of D3, D10 was also not relevant. Considering that the glycidyl groups of

the particles prepared in D3 were less hydrophilic they would be located inside the particles and would not be accessible to the solvent. In that respect, there was no evidence that sufficient hydroxyl groups were present in the particles of examples 16 and 19 of D3 so as to lead to the beneficial effects shown in the patent in suit. For those reasons D3 did not constitute a direct and unambiguous disclosure of the subject-matter of granted claim 1.

**Auxiliary request 3 - Article 123(2) EPC**

(b) Claim 2 was derivable from the combination of claims 3 and 4 of the application as filed. The passages on page 9, lines 8-16 hinted at the combination of magnetic particles and the tosyl group and taught that once tosylated, the polymeric particles being claimed would be suitable for probe binding. Polymer parts having a 2,3-dihydroxypropyl group were disclosed at page 70, lines 3-4 of the application as filed.

**Auxiliary request 3A - Admissibility**

(c) Auxiliary request 3A was filed in reply to the Board's communication in which it was indicated that auxiliary request 3 could infringe the requirements of Article 123(2) EPC. Until then, the patent proprietor had been convinced of the contrary and considered that the opposition division's conclusion in that respect was flawed. Auxiliary request 3A consisted in claim 7 of auxiliary request 3, which had not been objected to pursuant to Article 123(2) EPC. In that respect, claim 1 was based on original claim 9 in

combination with page 9, lines 8-12, page 55 (method iii)), page 62, lines 16-20 and page 68, lines 1-3 of the application as filed. Besides, auxiliary request 3A removed all concerns in respect of Article 54 EPC and Article 56 EPC.

- (d) It would be in particular fair to admit auxiliary request 3A to the proceedings in view of the unfair treatment received in the first instance proceedings, in which the patent proprietor had been obliged to select a limited number of auxiliary requests at the beginning of the oral proceedings.
- (e) According to G 9/91 (point 18 of the reasons), late filing was more restrictive for the opponent than for the patent proprietor.

**Auxiliary request 1 - Novelty**

- (f) The particles prepared in example 16 of D3 did not have a polyoxyethylene group as now defined in claim 1. There was further no evidence on file that the particles prepared in example 16 of D3 had a 2,3-dihydroxypropyl group and a polyoxyethylene group "at least on the surface of the particles" as now specified in claim 1. Also, it was derivable from paragraphs 30 and 33 of D3 that the epoxy containing monomers would be located inside the particles (core) and not at its surface.

**Auxiliary request 1A - Admissibility**

- (g) Similarly to auxiliary request 3A, auxiliary request 1A had been filed as soon as possible in reaction to the Board's communication. It aimed at



overcoming the objections of lack of novelty and inventive step retained against the higher ranking requests. Also, regarding Article 123(2) EPC, claim 1 was based on original claim 9 in combination with page 52, lines 9-11 and 17-19 of the application as filed.

**Auxiliary requests 2, 4 and 4A - Article 123(2) EPC**

- (h) Claim 1 of auxiliary request 2 was mainly based on page 64, lines 18-27 of the application as filed. The broader definition of the binding of the modifier (M) was an allowable generalisation based on the teaching of pages 62-63 of the application as filed according to which different methods to introduce the modifier (M) could be used.
- (i) The same arguments applied for claim 1 of each of auxiliary requests 4 and 4A.

**Auxiliary request 5 - Article 56 EPC**

- (j) The opponent's argumentation based on the combination of example 6 of D1 with D17 was late-filed and represented an amendment of the opponent's case. Considering that auxiliary request 5 corresponded to auxiliary request B on which the contested decision was based, there was no reason why D17 could not have been filed earlier, in particular during the first instance proceedings.

Examples 17 (similar to example 16) and 19 of D1 constituted the closest prior art. Since the particles prepared in those examples did not contain carboxyl surface groups and already

contained polyoxyethylene groups, the teaching of D17 was neither compatible with said closest prior art, nor would have had the skilled person any reason to contemplate combining both documents.

Therefore neither D17 nor the line of argumentation based on the combination of D1 and D17 should be admitted to the proceedings.

(k) Example 6 of D1 was not the closest prior art since the particles prepared therein did not undergo hydrolysis and, thus, did not comprise 2,3-dihydroxypropyl groups. Besides, the problem to be solved was to reduce the non specific adsorption of organic polymer particles. It would be illogical to start from a particle according to example 6 of D1, which contains many non specific adsorption sites at its surface and a concentration of sites on the polyoxyethylene groups. Rather, example 16 of D1 represented a more suitable starting point.

(l) Should example 6 of D1 be considered as closest prior art, the problem to be solved was to reduce non specific adsorption. The subject-matter of claim 1 differed from said closest prior art in that a modifier (M) comprising polyoxyethylene was bound to the particles. Considering that D1 already taught a way to introduce polyoxyethylene groups on page 7, line 29 (as was done in example 16 of D1), the skilled person would have had no motivation to look for another document in order to do so, in particular not to D17.

**Auxiliary request 6 - Article 56 EPC**

- (m) The same arguments as for auxiliary request 5 were valid. In addition, considering the high amount of acrylic acid used in example 6 of D1, the particles prepared therein would be covered therewith at its surface so that they would not exhibit 2,3-dihydroxypropyl groups on their surface as specified in claim 1.

**Auxiliary request 7 - Article 123(2) EPC**

- (n) The subject-matter of claim 1 was derivable from the combination of claim 3 as originally filed with page 52, lines 9-11, page 64, lines 17-27, page 66, section 4.2 (process III) and page 67, lines 3-15 of the application as filed.

XIX. The opponent's arguments, as far as relevant to the present decision, were essentially as follows:

**Main request (granted patent) - Novelty**

- (a) Granted claim 1 was *inter alia* anticipated by examples 16 and 19 of D3. It was derivable from D9, D10, D2/D2b and from paragraphs 218 and 246 of the patent in suit that the experimental conditions used in D3 led to hydrolysis of the epoxy groups, as illustrated in D3a.

**Auxiliary request 3 - Article 123(2) EPC**

- (b) The application as filed failed to provide a valid basis for the combination of technical features indicated in claim 2. In respect of the tosyl group, the subject-matter now being defined in

claim 2 represented an unallowable generalisation of the disclosure on page 69 of the application as filed. Also, the passage on page 9, lines 10-11 of the application as filed did not provide a basis for the amendment "having a 2,3-dihydroxypropyl group".

**Auxiliary request 3A - Admissibility**

(c) The patent proprietor had been aware since the date of issue of the contested decision, i.e. February 2013, that auxiliary request 3 did not satisfy the requirements of Article 123(2) EPC. There was no valid reason justifying the filing of auxiliary request 3A at such a late stage (19 July 2016), in particular only one week before the oral proceedings before the Board. Considering that claim 2 of auxiliary request 3 was not patentable, there had been no reason for the opponent to concentrate on claim 7 of that request beforehand, nor was it derivable from the patent proprietor's arguments. Also, admitting auxiliary request 3A would run counter to economy of the proceedings.

**Auxiliary request 1 - Novelty**

(d) For the same reasons as for the main request, it was to be expected from the chemistry involved in example 16 of D3 that at least some 2,3-dihydroxypropyl groups and polyoxyethylene groups would be present at least on the surface of the particles prepared therein. Those particles were used in example 22 and according to paragraph 136 of D3 because of their surface groups.

**Auxiliary request 1A - Admissibility**

(e) As for auxiliary request 3A, there was no valid reason for filing auxiliary request 1A so late, in particular because the novelty objection retained against auxiliary request 1 had already been raised in the opponent's submission dated 8 November 2013.

**Auxiliary requests 2, 4 and 4A - Article 123(2) EPC**

(f) The method disclosed on page 64, lines 18-27 of the application as filed imposed a coulomb binding between the carboxyl group of the organic polymer particles and the amino group of the modifier (M) of formula (1). Since that feature was not reflected in claim 1 of any of auxiliary requests 2, 4 and 4A, the requirements of Article 123(2) EPC were not satisfied.

**Auxiliary request 5 - Article 56 EPC**

(g) At the request of the Chairman, it was clarified during the oral proceedings before the Board that no objection remained regarding either the admission to the proceedings of auxiliary request 5, sufficiency of disclosure or novelty.

(h) A request comprising claims characterised by modifiers of formula (1) were first considered during the oral proceedings before the opposition division. Before that, the opponent had had no reason to concentrate on formula (1). Shortly after the oral proceedings, the opponent started a search for prior art directed to said formula (1) and D17 was filed as soon as possible. Simultaneously, the argumentation based on the combination of example 6

of D1 with D17 was provided, as early as in the submission dated 7 April 2014. Therefore, the patent proprietor could not have been taken by surprise.

D17 was a translation of the corresponding PCT application WO 2005/010529, which was a valid prior art under Article 54(2) EPC.

For those reasons, D17 should be admitted to the proceedings.

- (i) The closest prior art was constituted by the particles prepared in example 6 of D1, which were suitable for probe binding as shown in example 8 of D1. Contrary to the patent proprietor's argumentation, those particles did undergo hydrolysis under the experimental conditions used therein. In any case, 2,3-dihydroxypropyl groups were bound to be present due to the use of the glycidol monomers, as illustrated on page 2 of D1d. The problem to be solved mentioned in the patent in suit was to provide organic polymer particles exhibiting reduced non specific binding. However, no evidence was on file showing that that problem was indeed solved. Therefore, the problem was merely to provide organic polymer particles which have been subjected to an alternative modification treatment. The subject-matter of claim 1 differed from the particles of Example 6 of D1 in that a modifier (M) was bound to the particles. D17 taught, in particular in its example 11, a method of immobilising by probe binding which comprises coulomb binding a modifier corresponding to formula (1) of claim 1 to magnetic particles which have been surface treated so as to exhibit carboxy

surface groups. Therefore, the subject-matter of claim 1 was obvious in the light of the combination of example 6 of D1 with example 11 of D17.

**Auxiliary request 6 - Article 56 EPC**

(j) The same arguments as for auxiliary request 5 were valid.

**Auxiliary request 7 - Article 123(2) EPC**

(k) The subject-matter defined in claim 1 was not disclosed as such in the application as filed and was obtained by combining various passages of the application as filed which were disclosed independently of each other. Besides, the wording of page 67, lines 8-15 was not reflected in claim 1.

XX. The patent proprietor requested that the decision under appeal be set aside and the patent be maintained as granted (main request), or alternatively that the patent be maintained in amended form on the basis of any of the following auxiliary requests (in that order):

- auxiliary request 3 filed with letter of 4 November 2013;
- auxiliary request 3A filed with letter of 19 July 2016;
- auxiliary request 1 filed with letter of 4 November 2013;
- auxiliary request 1A filed with letter of 19 July 2016;
- auxiliary request 2 or 4 filed with letter of 4 November 2013;

- auxiliary request 4A filed with letter of 18 March 2014;
- auxiliary request 5, corresponding to auxiliary request B on which the contested decision is based;
- auxiliary request 6 or 7 filed with letter of 4 November 2013.

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

XXI. During the oral proceedings the Board decided that auxiliary requests 3A and 1A were not admitted to the proceedings and came to the conclusion that none of the main request and of auxiliary requests 3, 1, 2, 4 and 4A were allowable. In respect of the remaining auxiliary requests 5, 6 and 7, no conclusion was indicated as to their allowability. The Chairman further announced that the Board would not be giving a final decision during the oral proceedings but that the decision would be given in writing.

## **Reasons for the Decision**

### **Main request (granted patent)**

1. Novelty over D3
  - 1.1 D3 is the translation published in accordance with Article 158(3) EPC 1973 of the international application WO 2004/092 732 (D3', in Japanese) which was published on 28 October 2014, i.e. before the oldest priority of the patent in suit. Therefore D3' is prior art pursuant to Article 54(2) EPC. The analysis of D3' is hereinafter based on the contents of D3



assuming that the translation is in conformity with the contents of D3', which was already done in the contested decision (section 4.3 of the reasons for the decision; first sentence) and was not contested by the patent proprietor.

- 1.2 The opponent put forward that granted claim 1 was anticipated by examples 16 and 19 of D3.
  - 1.2.1 Example 16 and 19 of D3 disclose the aminolysis of polymer particles prepared by copolymerising glycidyl methacrylate (an epoxy group containing monomer) and either polyethylene glycol methacrylate (example 16: paragraph 108 of D3) or a polyoxyethylene reactive emulsifier HS10 (example 19: Table 4 and paragraph 115 of D3). The aminolysis step is performed at 10% ammonia water at 70°C for 20 hours.
  - 1.2.2 It is known in the art that epoxides undergo hydrolysis under either acid or basic conditions as agreed by the parties during the oral proceedings before the Board. This is confirmed by D10 (page 3857, left column, first section). The same conclusion may also be derived from paragraphs 218, 246 and 248 of the patent in suit, in which it is indicated that for products obtained by a similar polymerisation process to that obtained in D3, hydrolysis of the epoxy groups takes place. A similar finding is also taught in D2/D2b (section 11, second paragraph), which specifically deals with polymeric particles prepared from copolymers of glycidyl (meth)acrylate and another crosslinkable monomer.
  - 1.2.3 In view of the above it is credible that under the experimental conditions of examples 16 and 19 of D3 at least some hydrolysis of the epoxy groups does take place. Although the same conclusion was already drawn

by the opposition division (section 4.3 of the decision), the patent proprietor has provided no evidence to refute that finding. In those circumstances the Board is of the opinion that the burden of proof was shifted to the proprietor of the patent to demonstrate on appeal that the reasons for revoking the patent were not justified, i.e. that the opposition division's decision was wrong on its merits (section 3.2 of T 585/92; Case Law of the Boards of Appeal of the EPO, 8th Ed., 2016, III.G.5.2).

- 1.3 In particular no evidence was provided in support of the patent proprietor's argument according to which the glycidyl groups of the particles prepared in examples 16 and 19 of D3 would be located inside the particles and would not be accessible to the solvent. This would have been required in order to remove the presumption derived from the prior art cited above (D2, D10) and from the teaching of the patent specification itself (paragraphs 218, 246, 248).

Besides, considering that granted claim 1 contains no limitation in terms of the amount of hydroxyl groups originating from a 2,3-dihydroxypropyl group, granted claim 1 has to be read in its broadest sense and encompasses in particular particles having low amounts of such hydroxyl groups. Therefore, the patent proprietor's argument according to which granted claim 1 was limited to those particles having sufficient hydroxyl groups so as to lead to the beneficial effects shown in the patent in suit cannot be accepted.

- 1.4 In view of the above the subject-matter of granted claim 1 is not novel over examples 16 and 19 of D3 and the main request is not allowable.

### **Auxiliary request 3**

2. Amendments: Article 123(2) EPC
- 2.1 According to boards of appeal case law, for assessing if the requirements of Article 123(2) EPC are met in the case of multiple amendments being made, it has to be determined whether such a combination of features emerges from the application as filed (T 482/07, section 3.4.2 of the reasons). In that respect, the description is not to be seen as a reservoir from which features pertaining to separate embodiments can be freely and randomly combined in order to create a certain embodiment.
- 2.2 Claim 2 of auxiliary request 3 is in particular characterised in that it is directed to organic polymer particles for "probe binding" and which comprise a polymer part having i) "a 2,3-dihydroxypropyl group" (i.e. a propyl rest having two hydroxyl functionalities which are not substituted) and ii) "a tosyl group".
- 2.3 The sole passage of the application as filed relied upon by the patent proprietor in support for above feature i) is at page 70, lines 2-4 of the application as filed and reads "The organic polymer particles for probe binding of this embodiment may contain a 2,3-dihydroxypropyl group that has not been tosylated".
- 2.3.1 That passage is part of section 4.3 entitled "Organic polymer particles for probe binding and probe bound particles" which discloses various tosylation processes either in a general manner (page 69, lines 16-17) or in more specific ways (page 69, lines 17-20, 20-23, 24-27

and page 70, lines 1-2). In that respect it is further indicated that in specific embodiments the organic polymer particles may be tosylated at least on one of the hydroxyl group at the end of the polyoxyethylene group and the 2,3-dihydroxypropyl group on the surface of the particles. In particular, the sentence at page 70, lines 2-4 of the application as filed is the second sentence of the paragraph starting on page 69, line 24 of the application as filed, which is specifically directed to the tosylation of a reactive group of a 2,3-dihydroxypropyl group. It is further indicated on page 71, lines 3-11 of the application as filed that it is sufficient that at least a portion of a number of 2,3-dihydroxypropyl groups in the organic polymer particles are tosylated.

In view of the above, the passage at page 70, lines 2-4 of the application as filed is read as being directed to organic polymer particles containing 2,3-dihydroxypropyl groups, the hydroxyl groups of which having been subjected to a tosylation reaction and wherein at least some of the 2,3-dihydroxypropyl groups bear two hydroxyl groups which have not been tosylated.

Considering that claim 2 of auxiliary request 3 does not comprise that limitation in terms of the tosylation of a 2,3-dihydroxypropyl group, the passages relied upon by the patent proprietor don't provide a valid support for the subject-matter of claim 2 of auxiliary request 3.

2.3.2 Besides, section 4.3 of the application as filed relied upon by the patent proprietor does not make reference to the specific polymeric particles defined in claim 2 (comprising nuclear particles and a magnetic material

layer containing superparamagnetic fine particles).

As indicated by the patent proprietor, such particles are defined on page 9, lines 8-12 of the application as filed, while it is further indicated in the next line (page 9, line 13), that those particles may contain a tosyl group (i.e. in a generic manner).

However, it was not shown that there is any pointer in the application as filed to the specific combination of features according to claim 2, in particular to the combination of page 9, lines 8-13 and page 70, lines 2-4. Nor has the patent proprietor shown why the skilled person would have found the implicit information to combine those features.

The same reasoning applies when considering the combination of original claims 3 and 4 with page 70, lines 2-4 of the application as filed as argued by the patent proprietor because, considering that original claims 3 and 4 were not related to each other, the sole disclosure of organic polymer particles as defined in original claim 3 and having a tosyl group according to original claim 4 is constituted by the passage at page 9, lines 8-13 of the application as filed (see section 2.3).

- 2.4 Under these circumstances, the subject-matter of claim 2 is not directly and unambiguously derivable from the application as filed and auxiliary request 3 does not satisfy the requirements of Article 123(2) EPC.

### **Auxiliary request 3A**

#### 3. Admissibility

3.1 Auxiliary request 3A was filed with letter of 19 July 2016, i.e. one week before the oral proceedings before the Board. Therefore, it represents an amendment to a party's case pursuant to Article 13(1) RPBA and its admission to the proceedings is subject to the Board's discretion (Article 13(1) RPBA) and underlies the stipulations of Article 13(3) RPBA.

3.2 According to the patent proprietor auxiliary request 3A was submitted specifically to address the Article 123(2) EPC objection retained against auxiliary request 3 but was only submitted once it had been informed of the Board's preliminary opinion.

3.2.1 However, said objection pursuant to Article 123(2) EPC had already been raised by the opponent in the first instance proceedings and had been retained by the opposition division (section 5 of the reasons for the contested decision). The patent proprietor was, thus, well aware of that objection already when filing its statement of grounds of appeal but had decided to wait until the Board's communication to react. In that respect, the issue identified by the Board in respect of Article 123(2) EPC (section 9.4.6) had already been addressed in the first-instance proceedings and in the appellant's statement of grounds of appeal. It is noted in that context that with respect to claim 2 of auxiliary request A discussed during the oral proceedings before the opposition division and decided upon in the contested decision, the wording of claim 2 of auxiliary request A was, apart from the presence of "the" before "superparamagnetic" identical to claim 2

of present auxiliary request 3A, those claims having therefore the same meaning. Also, no new objection was raised *ex officio* by the Board and no new line of argument was raised by the opponent (see Case Law of the Boards of Appeal of the EPO, 8<sup>th</sup> Ed., 2016, IV.E. 4.4.12). Therefore, in the present circumstances of the case, it was not shown that an unexpected development of the case may have justified the late filing of auxiliary request 3A.

3.2.2 The Board further notes that no substantiation was provided by the patent proprietor together with auxiliary request 3A to explain why that request satisfied the requirements of Article 123(2) EPC and that those arguments were submitted for the first time during the oral proceedings. Such a request, which is not self-explanatory, is in the present case considered to have been submitted only on the date of its substantiation i.e. during the oral proceedings before the Board (see T 1732/10, section 1.5 of the reasons).

3.2.3 The patent proprietor considered that the Board should take into account that it received an "unfair treatment" in the first instance proceedings.

In that respect, it may be derived from the minutes of the oral proceedings before the opposition division (page 1, paragraphs 2-5) that before any discussion of the main request took place, the patent proprietor was asked to select a single auxiliary request out of those then pending. However, the patent proprietor did not contest that conduct of the proceedings. Also, it does not appear to have been clarified during the oral proceedings whether or not said "selection" of an auxiliary request amounted to a withdrawal of the requests pending at the beginning of the oral

proceedings. Although it is not indicated in the minutes of the oral proceedings that the patent proprietor effectively withdrew those auxiliary requests, the opposition division concluded that he did (decision: page 3; last paragraph before the reasons). This is also the opponent's view (letter of 7 April 2014, page 6, section 5) but not that of the patent proprietor (letter of 4 November 2013, page 4, second full paragraph).

In view of the above, the Board came to the conclusion that the conduct of the oral proceedings was not appropriate but that no formal request had been submitted by the patent proprietor to address the way the oral proceedings before the opposition division had been conducted. Most importantly, no casual link between the alleged procedural deficiency before the opposition division and the filing of auxiliary request 3A only one week before the oral proceedings before the Board can be recognised. Therefore, the patent proprietor's argument was rejected.

3.2.4 Section 18 of the reasons of G 9/91, which was relied upon by the patent proprietor, deals with the admission to the proceedings of fresh grounds of opposition and is, thus, not directly relevant for the late filing of requests by the the patent proprietor as in the present case. As explained above, the admission to the proceedings of late filed requests has to be assessed in the light of the Rules of Procedure of the Boards of Appeal, in particular Article 12(2), 12(4), 13(1) and 13(3). Therefore, that argument did not convince.

3.2.5 In view of the above, auxiliary request 3A was not admitted into the proceedings (Article 13(1) RPBA).



**Auxiliary request 1**

4. Novelty over example 16 of D3
- 4.1 Claim 1 of auxiliary request 1 differs from granted claim 1 in that:
  - (a) the polyoxyethylene group is defined by a formula and specified to have an -OH endgroup;
  - (b) it defines that the particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group "at least on the surface of the particles".
- 4.2 Example 16 of D3 was found to anticipate the subject-matter of granted claim 1 (see section 1 above). Considering that the particles prepared in example 16 of D3 are made from a mixture of monomers comprising polyethylene glycol methacrylate, which is a monomer having polyoxyethylene groups as now defined in claim 1 i.e. comprising at least two repeating units of oxyethylene and an -OH endgroup, amendment (a) cannot confer novelty over example 16 of D3.
- 4.3 As explained in respect of the main request, it is further to be expected from the chemistry involved in example 16 of D3 and from the teaching of the prior art (D2, D10) as well as from the patent in suit that at least some 2,3-dihydroxypropyl group and a polyoxyethylene group will be located "at least on the surface of the particles" prepared in example 16 of D3.
- 4.4 The patent proprietor's argument according to which the particles prepared in example 16 of D3 would not satisfy above feature (b) is not supported by any evidence and, in view of the above, fails to convince.

- 4.5 D3 teaches that the particles prepared therein are made from a polymer comprising a monomer not having a hydrophilic group for forming a core and a monomer having a hydrophilic group for forming a shell (paragraph 30). Examples of the former are styrene and glycidyl methacrylate, which are preferred (paragraphs 30 and 34), and both used in example 16 of D3 in rather high amounts as compared to the other hydrophilic group containing monomers (see paragraph 108, first sentence). In particular, it is indicated in paragraph 35 of D3 that the relative amounts of those monomers may influence the stability of the dispersion which appears to confirm that those monomers are, at least in part, also located at the surface of the particles. For those reasons, it is not credible that no 2,3-dihydroxypropyl group may be present at the surface of the particles prepared in example 16 of D3, as argued by the patent proprietor.
- 4.6 Under those circumstances, the subject-matter of claim 1 is not novel over example 16 of D3.

#### **Auxiliary request 1A**

5. Admissibility
- 5.1 The admission to the proceedings of Auxiliary request 1A, which was filed together with auxiliary request 3A one week before the oral proceedings before the Board, is, for the same reasons as indicated in section 3.1 above, subject to the Board's discretion (Article 13(1) and 13(3) RPBA).
- 5.2 According to the patent proprietor auxiliary request 1A was in particular submitted to address the novelty objection retained against auxiliary request 1 but was

only submitted once the it had been informed of the Board's preliminary opinion.

- 5.2.1 However, similarly to auxiliary request 3A, it was not shown in the present case that any unexpected development of the case may have justified the late filing of auxiliary request 3A. In particular, it is noted that as may be seen from the patent proprietor's reply dated 18 March 2014, section 5.a (page 8/13), the patent proprietor was well aware of the novelty objection raised by the opponent against claim 1 of auxiliary request 1. However, although counter arguments were submitted, the patent proprietor has decided neither to submit any evidence to refute the opponent's objection (which was based on the finding of the opposition division: see letter of 8 November 2013, section 5.3.1) nor to provide a request in the line of present auxiliary request 1.
- 5.2.2 It is true that the sole claim of auxiliary request 1A corresponds to claim 9 of auxiliary request 1 submitted with letter of 4 November 2013. However, no arguments were provided in that letter explaining why that claim 9 would be allowable. It is only with written submissions of 19 July 2016 i.e. one week before the oral proceedings that arguments in support of novelty and inventive step were provided. A substantiation as to why claim 1 of that request would overcome the objection under Article 123(2) EPC was only provided during the oral proceedings before the Board. As explained for auxiliary request 3A (see section 3.2.2), such a request is considered to have been submitted only on the date of its substantiation i.e. at the earliest one week before the oral proceedings before the Board.

5.2.3 Further considering that auxiliary request 1A was not submitted at any time during the first instance proceedings, it cannot be held that the manner in which the oral proceedings before the first instance was conducted could justify to admit auxiliary request 1A at such a late stage of the proceedings (see section 3.2.3).

5.2.4 Finally, the Board also took into account that claim 1 of auxiliary request 1 is directed to a process mostly based on original claim 9 as originally filed. It does not appear that the opponent would have had any reason, up to the filing of auxiliary request 1, to concentrate on the process defined in said original claim 9, in particular in view of the high number of requests (and changes in their sequence to be dealt with) submitted by the patent proprietor during the appeal proceedings. The admission of auxiliary request 1A would have, thus, likely required that the parties and the Board (or the first instance in case of remittal) would have had to deal with new issues for the first time during the oral proceedings before the Board, which runs counter to the economy of the procedure.

5.3 For those reasons, auxiliary request 1A was not admitted into the proceedings (Article 13(1) RPBA).

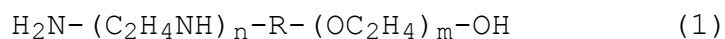
### **Auxiliary request 2**

6. Amendments: Article 123(2) EPC

6.1 Claim 1 of auxiliary request 2 corresponds to claim 1 of the application as filed, which was in particular modified by addition of the following features:

- "wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles" and
- "the organic polymer particles being obtainable by a process comprising binding a modifier (M) with organic polymer particles to produce the polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group,

wherein the modifier (M) is represented by the following formula (1)



wherein  $n=2$  to  $20$ ,  $m=2$  to  $200$ , and R is a divalent hydrocarbon group".

6.2 The sole passage of the application as filed relied upon by the patent proprietor as providing a support for modifier (M) of formula (1) is page 64, lines 18-27 of the application as filed.

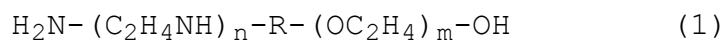
That passage is the last paragraph of section 4.1.2-4 starting on page 62 of the application as filed, which discloses different methods of binding to the polymeric particles a modifier (M) having a polyoxyethylene group. Indeed, different methods are exemplified e.g. on page 62, line 25 to page 63, line 2, page 63, line 7ff, line 17ff, line 21ff, line 24ff, page 64, line 8ff and line 15ff. However, the passage at page 64, lines 18-27 reads as follows: "As a most preferable example, a method of introducing a carboxyl group into the organic polymer particles and coulomb bonding the carboxyl group with the amino group of the

modifier (M) of the following formula (1)...".  
Therefore, the method disclosed therein constitutes a very specific embodiment ("most preferable example") directed to a single method of bonding modifier (M), namely by coulomb binding the carboxyl group of the particles with the amino group of modifier (M).  
Contrary to the patent proprietor's argumentation, it cannot be considered that the application as filed directly and unambiguously discloses that said passage of the application as filed may be modified in view of the preceding methods disclosed in section 4.1.2-4.  
Therefore, considering that claim 1 of auxiliary request 2 is not limited in the manner how modifier (M) is bound to the organic polymer particles, the requirements of Article 123(2) EPC are not met and auxiliary request 2 is not allowable.

**Auxiliary requests 4 and 4A**

- 7. Amendments: Article 123(2) EPC
- 7.1 Claim 1 of auxiliary request 4 corresponds to claim 1 of the application as filed, which was modified by addition of the following features:
  - "wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles" and
  - "the organic polymer particles being obtainable by a process comprising coulomb binding or amide binding a modifier (M) with organic polymer particles having a 2,3-dihydroxypropyl group,  
  
wherein the modifier (M) is represented by the

following formula (1)



wherein,  $n=2$  to  $20$ ,  $m=2$  to  $200$ , and  $R$  is a divalent hydrocarbon group".

- 7.2 Similarly to auxiliary request 2, the sole passage of the application as filed providing a support for said amendment is page 64, lines 18-27. However, since claim 1 of auxiliary request 4 encompasses embodiments in which the coulomb binding between the particles and modifier is not limited to "coulomb binding the carboxyl group of the particles with the amino group of modifier (M)" according to page 64, lines 18-27 (see wording of claim 1: "coulomb binding or amide binding"), the requirements of Article 123(2) EPC are not met for the same reasons as for auxiliary request 2.
- 7.3 Claim 1 of auxiliary request 4A corresponds to claim 1 of auxiliary request 4 modified as a use claim. Therefore, the same conclusion as for auxiliary request 4 applies.
- 7.4 In view of the above, auxiliary requests 4 and 4A are not allowable (Article 123(2) EPC).

#### **Auxiliary request 5**

8. Inventive step
- 8.1 Admission to the proceedings of D17
- 8.1.1 D17 is the English translation published in accordance with Article 158(3) EPC 1973 of the international

application WO 2005/010529 (D17', in Japanese) which was published before the oldest priority of the patent in suit. Therefore D17' is a valid prior art according to Article 54(2) EPC. The analysis of D17' is hereinafter based on the contents of D17 assuming that the translation is in conformity with the contents of D17', which was argued by the opponent (letter dated 8 November 2013, page 3, second paragraph) and was not contested by the patent proprietor.

8.1.2 D17 was first submitted by the opponent during the appeal proceedings, not with its statement setting out the grounds for appeal but with its reply to the patent proprietor's statement of grounds of appeal (letter of 8 November 2013). Therefore, D17 was submitted pursuant to the stipulations of Article 12(2) RPBA.

8.1.3 It is derivable from the file history that auxiliary request 5 mainly corresponds to auxiliary request 1c, which was the first of the patent proprietor's numerous requests submitted during the opposition proceedings which was directed to particles having modifiers (M) of formula (1) coulomb bound to it as defined in claim 1. However, said auxiliary request 1c had been submitted on 18 January 2013, less than one week before the oral proceedings were held before the opposition division on 23 January 2013. Until that date, there is no evidence on file that the opponents had any reason to concentrate on that feature which was not even present in any pending dependent claims but only in the description. Therefore, the explanation provided by the opponent according to which they had to perform a further search directly after the oral proceedings in order to react to the new situation created by the insertion of the feature defining an amino group modifier of formula (1), is a proper justification for



filing that document on appeal.

In addition, the opponent's letter of 8 November 2013 contains on page 3 arguments concerning the relevance of that document in respect of the known existence of modifiers of formula (1).

Under such circumstances, the Board held that it was not justified not to admit D17 to the proceedings pursuant to Article 12(4) RPBA.

8.2 Admission to the proceedings of the opponent's line of argumentation based on the combination of D1 and D17

The opponent's line of argumentation based on the combination of D1 and D17 was first submitted in the opponent's letter dated 7 April 2014, i.e. after its reply to the patent proprietor's statement of grounds of appeal dated 8 November 2013. However, said letter of 8 November 2013 does not make reference to the patent proprietor's letter dated 4 November 2013, with which the patent proprietor indicated for the first time in appeal proceedings that they were maintaining the request allowed by the opposition division as a pending request for the appeal proceedings. It is only in the opponent's letter dated 7 April 2014 that reference is made to the patent proprietor's letter of 4 November 2013. Under those circumstances, the Board holds that the opponent's reply dated 7 April 2014 may be considered as a *bona fide* reply to the patent proprietor's statement of grounds of appeal.

Besides, the opponent's line of argumentation based on D1 and D17 was submitted early enough in the proceedings in order to allow the patent proprietor and the Board to assess its merits.

Finally, D17 was considered *prima facie* highly relevant in respect of the assessment of the inventive step, since it is the first document disclosing a method of reducing non specific adsorption by bonding a modifier of formula (1) according to operative claim 1 to carboxylic acid surface treated magnetic particles (example 11).

For those reasons, the Board held that it would not be justified not to admit to the proceedings the opponent's line of argumentation based on the combination of D1 and D17 and exercised its discretion to admit it (Article 13(1) RPBA).

### 8.3 Closest prior art

8.3.1 According to paragraphs 2-5, 11 and 15, the patent in suit relates to organic polymer particles which are suitable for probe binding and which exhibit low non specific adsorption (i.e. increased sensitivity). In particular, auxiliary request 5 is directed to the fourth embodiment of such particles described in the patent in suit (starting from line 31 on page 20) which is directed to organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and a polyoxyethylene group.

8.3.2 Both parties considered that D1, which deals with magnetic polymer particles that may suitably used for probe binding (page 1, lines 3-18; page 10, line 21 to page 12, line 11; page 13, line 12 to page 15, line 5; examples 16, 17, 19 and 20), was the closest prior art document. The Board has no reason to depart from that view.

8.3.3 However, whereas the opponent considered that example 6 of D1 was the most suitable starting point, the patent proprietor considered that it was example 16 or example 17 of D1.

(a) As shown on page 4 of D1d and on pages 4 and 5 of D15, the particles prepared in example 6 of D1 exhibit a carboxyl group and a 2,3-dihydroxypropyl group (from the reaction of glycidol with the amine functional groups: see page 19, lines 7-12 of D1) but fail to contain a polyoxyethylene group and a modifier (M) and therefore don't exhibit a coulomb binding as defined in operative claim 1. However, said particles are suitable for probe binding as shown in example 8 of D1.

(b) As shown on page 3 of D1b and on page 2 of D1A, the particles prepared in examples 16 or 17 of D1 exhibit a polyoxyethylene group (from the reaction of polyethyleneglycol diglycidyl ether with the amine functional groups: see page 25, lines 1-7 of D1) but fail to contain a 2,3-dihydroxypropyl group, a carboxyl group and a modifier (M) and therefore don't exhibit a coulomb binding as defined in operative claim 1. However, said particles are suitable for probe binding as shown in example 19 of D1.

(c) In view of the above, it is concluded that examples 6, 16 and 17 of D1 are all directed to the same problem as the patent in suit but that example 6 of D1 has more structural features in common with operative claim 1 than examples 16 or 17 of D1. Therefore, example 6 of D1 constitutes the closest prior art and the starting point for

the assessment of the inventive step.

8.4 Problem solved over the closest prior art

8.4.1 During the oral proceedings before the Board, the patent proprietor argued that the problem to be solved over example 6 of D1 was to provide organic polymer particles exhibiting reduced non specific adsorption.

8.4.2 It was not contested during the proceedings that the patent in suit contains no examples illustrating the subject-matter of operative claim 1, in particular organic polymer particles comprising a modifier (M) as defined therein. Also, no comparison between particles according to operative claim 1 and example 6 of D1 is on file.

8.4.3 According to EPO case law, alleged but unsupported advantages cannot be taken into consideration in respect of the determination of the problem underlying the invention (Case Law of the Boards of Appeal of the EPO, 8<sup>th</sup> Ed. 2016, I.D.4.2). Under such circumstances, the alleged reduction of non specific adsorption cannot be retained in the formulation of the problem effectively solved over the closest prior art and the latter has to be reformulated as residing in the provision of further organic polymer particles for probe binding in alternative to those of example 6 of D1.

8.5 Solution

The solution provided by operative claim 1 resides in that the particles defined therein are characterised in that they comprise a modifier (M) of formula (1)

coulomb bonded to the carboxyl groups of the particles.

## 8.6 Obviousness

- 8.6.1 The question to be answered is if the skilled person desiring to solve the above identified problem would, in view of the prior art, have modified the disclosure of example 6 of D1 in such a way as to arrive at the claimed subject matter, in particular in view of the teaching of D17 as argued by the opponent.
- 8.6.2 It was not contested that D17 belongs to the same technical field as the patent in suit and also aims at providing polymeric particles for probe binding (D17: paragraphs 1 and 6). It is further conspicuous that D17 also aims at limiting non specific adsorption (D17: title; paragraph 5; example 11). Therefore, there would have been no reason preventing the skilled person confronted with the above defined problem to be solved and starting from example 6 of D1 as closest prior art to consider the teaching of D17.
- 8.6.3 In particular, example 11 of D17 is directed to the surface treatment of carboxylic acid surface particles using a modifier PEHA-Phenyl-PEG-OH (paragraph 67 of D17), which corresponds to a modifier (M) according to operative claim 1 (see paragraphs 37 and 39 of D17), which was not contested by the patent proprietor. The treatment with PEHA-Phenyl-PEG-OH is described to inhibit non specific adsorption or non specific bonding. Furthermore the specific mentioning of particles having carboxylic acids on their surface and being treated with PEHA-Phenyl-PEG-OH suggests an interaction between the carboxylic groups of the surface and the modifier used in example 11 of D17 such as coulomb binding.

Although the exact nature of the particles used in example 11 of D17 could not be clarified, in particular during the oral proceedings before the Board, it was neither argued nor shown why, should the particles used in example 11 of D17 and those prepared in example 6 of D1 be different, this could have prevented the skilled person from combining the teaching derived from example 11 of D17 with example 6 of D1. To the contrary, in the Board's view, since example 6 of D1 is directed to particles having carboxylic acid groups at their surfaces, as is the case of the particles surface treated in example 11 of D17, the skilled person would have considered applying the teaching of example 11 of D17 to the particles of example 6 of D1 and coulomb binding the carboxyl groups on the surface of the particles of example 6 of D1 with the amino groups of the modifier PEHA-Phenyl-PEG-OH of example 11 of D17. That conclusion is in particularly drawn in view of the formulation of the problem to be solved identified above, which resides in the provision of a mere alternative to example 6 of D1 for probe binding.

- 8.6.4 Under such circumstances, it is obvious to solve the technical problem identified in section 8.4.3 above by applying the teaching of example 11 of D17 to the particles prepared in example 6 of D1. Therefore, the subject-matter of claim 1 is not inventive and auxiliary request 5 is not allowable.

**Auxiliary request 6**

9. The particles defined in claim 1 of auxiliary request 6 differ from those defined in claim 1 of auxiliary request 5 only in that they must comprise "a 2,3-dihydroxypropyl group and a polyoxyethylene group at

least on the surface of the particles".

9.1 As compared to auxiliary request 5, the only additional argument submitted by the patent proprietor is that the particles prepared in example 6 of D1 would not exhibit a 2,3-dihydroxypropyl group on the surface of the particles, as now defined in operative claim 1.

9.2 However, said argument is not supported by any evidence. Besides, considering the chemistry involved and as illustrated e.g. on page 4 of D1d, it is credible that the acrylic acid used in example 6 of D1 to functionalize the particles reacts with the terminal alkenyl group to form a polyacrylic acid group and does not remain as monomers that adhere to the surface and cover the particles, as argued by the patent proprietor. Neither evidence nor arguments were submitted by the patent proprietor to refute the opponent's analysis of the chemistry involved in said example 6 of D1.

In view of the above, the feature identified by the patent proprietor as distinguishing the particles defined in claim 1 of auxiliary request 6 from those defined in claim 1 of auxiliary request 5 is, in the Board's mind, implicitly satisfied by the particles obtained when combining example 6 of D1 with the teaching of example 11 of D17, a measure which is obvious as shown in section 8.6 above.

9.3 For that reason, claim 1 of auxiliary request 6 cannot remove the objection of lack of an inventive step identified above in respect of claim 1 of auxiliary request 5. Auxiliary request 6 is, thus, not allowable (Article 56 EPC).

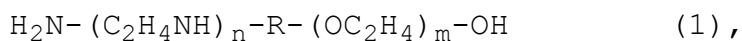
**Auxiliary request 7**

10. Amendments: Article 123(2) EPC

10.1 Claim 1 differs from claim 3 of the application as filed in that it contains the following additional features:

(i) "wherein the organic polymer particles have a 2,3-dihydroxypropyl group and a polyoxyethylene group at least on the surface of the particles",

(ii) the organic polymer particles being obtainable by a method of introducing a carboxyl group into organic polymer particles having a hydroxyl group originating from a 2,3-dihydroxypropyl group and coulomb binding the carboxyl group with the amino of the group modifier (M) of the following formula (1)



wherein,  $n=2$  to  $20$ ,  $m=2$  to  $200$ , and R is a divalent hydrocarbon group,"

10.2 A basis for each of amendments (i) and (ii) may be found on page 52, lines 9-11 and on page 64, lines 17-27 of the application as filed, respectively. However, it was not shown that there is any pointer to the specific combination of those features in the application as filed, in particular in respect of the specific particles according to original claim 3. Nor has the patent proprietor shown why the skilled person would have considered that those features should be used in combination.

The passages on page 66, section 4.2 (process III) and of page 67, lines 3-15 of the application as filed



relied upon by the patent proprietor are directed to particles characterised by technical features such as "nuclear particles of a non-magnetic material", "core/shell structure", "outermost organic polymer layer", which are not reflected in original claim 3. Therefore, said passages cannot provide a valid basis for the subject-matter of operative claim 1 at the present level of generality.

In view of the above, the combination of technical features of operative claim 1 can only be arrived at after combining original claim 3 with two other passages that were only disclosed in an individualised form in the application as filed. Under such circumstances, the subject-matter of operative claim 1 is not directly and unambiguously derivable from the application as filed and auxiliary request 7 does not satisfy the requirements of Article 123(2) EPC (see section 2.1 above).

11. None of the patent proprietor's requests being allowable or admissible the patent in suit has to be revoked.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



B. ter Heijden

F. Rousseau

Decision electronically authenticated