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D E C I S I O N
of 8 September 2005

Case Number: T 0344/03 - 3.3.3

Application Number: 92918448.9

Publication Number: 0598836

IPC: C08K 3/34

Language of the proceedings: EN

Title of invention:

Melt process formation of polymer nanocomposite of exfoliated layered material

Patentee:

AlliedSignal Inc.

Opponent:

Fumio Goto
AMCOL International Corporation
LANXESS Deutschland GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 23(4), 84, 123(2)
EPC R. 88
RPBA Art. 11(1) (1982 version)

Keyword:

"Appeal procedure - late filed claims - not admitted"
"Amendments - Article 123(2) and Article 123(3)"
"Amendments - correction of errors (no)"
"Clarity (no)"

Decisions cited:

T 0382/96

Catchword:

-



Case Number: T 0344/03 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 8 September 2005

Appellant:
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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office dated 18 December 2002
and posted 24 January 2003 revoking European
patent No. 0598836 pursuant to Article 102(1)
EPC.**

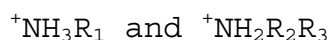
Composition of the Board:

Chairman: R. Young
Members: A. Däweritz
H. Preglau

Summary of Facts and Submissions

I. The grant of European patent No. 0 598 836 in respect of European patent application No. 92 918 448.9, based on International patent application PCT/US92/06732, filed on 12 August 1992, published as WO-A-93/04117 on 4 March 1993 and claiming priorities of 12 August 1991 and 26 November 1991 of two earlier applications in the U.S.A. (744035 and 798489), respectively, was announced on 15 October 1997 (Bulletin 1997/42). The patent was granted with nine claims, comprising the independent Claims 1 and 9 reading as follows:

"1. Composite material comprising a polymer matrix which comprises a polymer selected from polylactones, polyurethanes, polycarbonates, polysulfones, polyamides, polyesters, poly(arylene oxides); poly(arylene sulfides), vinyl polymers and copolymers, acrylic polymers and copolymers, polyolefins, rubbers; cellulose and silicones, and less than 60% by weight, based on the composite material, of dispersed platelet particles having an average thickness of less than 5nm (50 Å) and a maximum thickness of 10 nm (100 Å), and having an onium chemical species bonded to them in an amount equal to or greater than 10 mmole of said species/100g of particles, said chemical species being selected from onium compounds of the formula:



wherein:

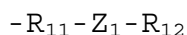
R₁ is an organic radical having at least 12 aliphatic carbon atoms, and R₂ and R₃ are the same

or different and are organic radicals having at least 4 carbon atoms; and

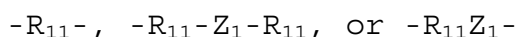
R_1 , R_2 and R_3 are alkyl, alkenyl, alkynyl, aryl, alkoxy, alkoxyalkyl, aryloxyalkyl, aryloxyaryl, cycloalkyl, cycloalkenyl, cycloalkynyl, alkanoylalkyl, alkylaryl, arylalkyl, amino, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylarylaminoalkyl, alkylsulfinyl, alkylsulfonyl, alkylthio, arylsulfinyl, arylsulfonyl, arylthio, alkoxy-carbonylalkyl, or a moiety of the formula:



wherein R_8 is alkyl, cycloalkyl, or aryl, R_9 is hydrogen, alkyl, or aryl, q is an integer equal to or greater than 1, and Z is $-O-$ or $-NR_{10}-$ where R_{10} is hydrogen, alkyl, aryl, or alkylsilane, or a moiety of the formula:



or R_2 and R_3 together form a divalent moiety of the formula:



which, together with the nitrogen atom to which they are attached, completes a heterocyclic ring, wherein $-R_{11}-$ is alkylene, alkenylene, or alkynylene, and $-Z_1-$ is $-O-$, $-NR_{13}-$, $-^+N(R_{13})_2--S-$, $-S(O)_2-$, $-OC(O)-$, or $-N(R_{13})C(O)-$, wherein R_{12} is alkyl, alkylaryl, alkoxyalkyl, alkenyl, alkynyl, aryl, cycloalkyl, or cycloalkenyl, and

R_{13} is hydrogen or alkyl having from 1 to 4 carbon atoms,

wherein the onium compounds are either unsubstituted or have as substituents amino, alkenyl, oxide, acyloxy, hydroxy, isocyanato,

ureido, halo, epoxy, epichlorohydrin, sulfuryl halide, mercapto, ester, $-NH_2$, $CONH_2$, CH_2-X , (where X is Cl, Br, or I), $-CH=CH_2$, $-SH$, S^+M^- , or O^-M^+ (where M^+ is Na^+ , Li^+ and K^+)"

- "9. A process for forming a composite material according to any one of Claims 1 to 8, said process comprising the steps of:
- (a) forming a flowable mixture comprising a melt of the polymer at a temperature equal to or greater than $220^\circ C$ and a swellable material comprising intercalated layered aggregates of platelet particles having an onium species as defined in Claim 1 bonded to the surface of the particles in an amount of at least 10 mmole of species/100g of particles, said platelet particles being present in an amount less than 60% by weight of said composite material; and
 - (b) subjecting said mixture to a shear greater than 10 sec^{-1} to dissociate all or a portion of said platelet particles to form particles having an average thickness of less than 5nm (50 Å) and a maximum thickness of 10nm (100 Å) and to uniformly disperse said platelet particles in said polymer."

The remaining Claims 2 to 8 related to elaborations of the composite material according to Claim 1.

- II. On 14, 15 and 15 July 1998, respectively, three Notices of Opposition were filed, in which revocation of the patent in its entirety was requested. According to Opponent 01, the subject-matter of the patent in suit was not patentable within the terms of Articles 52 to 57 EPC (Article 100(a) EPC). Opponent 02 based its

opposition on the grounds of Articles 100(a) and 100(b) EPC. Opponent 03 referred to the grounds of Article 100 EPC, in particular to those of Articles 100(a), 100(b) and 100(c) EPC, namely because the subject-matter claimed did not meet the requirements of Articles 54, 56, 83 and 123(2) EPC. In order to support their respective objections under Article 100(a) EPC, the opponents cited altogether 21 documents.

With the reply letter dated 18 April 2001, the Patent Proprietor withdrew the claims of the patent as granted and replaced them by a new set of claims (this request will be referred to as the "2001 request", herein below). Its independent Claims 1 and 7 read as follows:

"1. A composite material comprising:

(a) a polymer matrix comprising a melt processible polyamide polymer having a melt processing temperature equal to or greater than 220°C, and
(b) from 0.001 to less than 60% by weight, based on the composite material, of dispersed platelet particles having an average thickness of less than 5nm (50Å) and a maximum thickness of 10nm (100Å) and having an onium chemical species bonded to them in an amount equal to or greater than 10 mmole of said species/100g of particles, said chemical species being selected from onium compounds of the formula



wherein R₁ has the formula

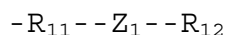


having at least 12 aliphatic carbon atoms,
and R₂ and R₃ are the same or different and are organic radicals having at least 4 carbon atoms selected from alkyl, alkenyl, alkynyl, aryl, alkoxy, alkoxyalkyl,

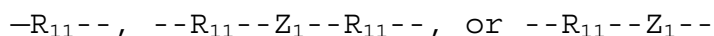
alkoxyaryl, cycloalkyl, cycloalkenyl, cycloalkynyl, alkanoylalkyl, alkylaryl, arylalkyl, amino, alkylaminoalkyl, dialkylaminoalkyl, alkylarylaminoalkyl, alkylsulfinyl, alkylsulfonyl, alkylthio, arylsulfinyl, arylsulfonyl, arylthio, alkoxycarbonylalkyl, a moiety of the formula



wherein R_8 is alkyl, cycloalkyl, or aryl, R_9 is hydrogen, alkyl or aryl, q is an integer equal to or greater than 1, and Z is $-\text{O}-$, $-\text{NR}_{10}-$ where R_{10} is hydrogen, alkyl, aryl or arylsilane, or a moiety of the formula



or R_2 and R_3 together form a divalent moiety of the formula



completing a ring, wherein R_{11} [sic] is alkylene, alkylenylene [sic], or alkynylene and Z_1 is $-\text{O}-$, $-\text{NR}_{13}$, $-$, $-\text{N}(\text{R}_{13})_2-$, $-\text{S}-$, $-\text{S}(\text{O})_2-$, $-\text{O}(\text{C})\text{O}-$ [sic] or $-\text{N}(\text{R}_{13})\text{C}(\text{O})-$, wherein R_{11} [sic] is alkylene, alkenylene or alkynylene, and Z_1 is $-\text{O}-$, $-\text{N}(\text{R}_{13})_2-$ [sic], $-\text{N}(\text{R}_{13})_2-$ [sic], $-\text{S}-$, $-\text{S}(\text{O})_2-$, $-\text{OC}(\text{O})-$ or $-\text{N}(\text{R}_{13})\text{C}(\text{O})-$, wherein R_{12} is alkyl, alkylaryl, alkoxyalkyl, alkenyl, alkynyl, aryl, cycloalkyl or cycloalkenyl, and R_{13} is hydrogen or alkyl having from 1 to 4 carbon atoms, and

wherein the onium compounds are either unsubstituted or have as substituents amino, alkenyl oxide, acyloxy, hydroxy, isocyanato, ureido, halo, epoxy, epichlorohydrin, sulfuranyl halide, mercapto, ester, $-\text{NH}_2$, $-\text{CONH}_2$, $-\text{CH}_2$ (where X is Cl, Br, or I) [sic], $-\text{CH}=\text{CH}_2$, SH , S^-M^+ or O^-M^+ (where M^+ is Na^+ , Li^+ , or K^+).

"7. A process for forming a composite material according to any one of Claims 1 to 6, said process comprising the steps of

(a) forming a flowable mixture comprising a melt of the polymer at a temperature equal to or greater than 220°C and a swellable material comprising intercalated layered aggregates of platelet particles having an onium species as defined in Claim 1 bonded to the surface of the particles in an amount of at least 10 mmole of species/100g of particles, said platelet particles being present in an amount of from 0.001 to less than 60% by weight of said composite material, and

(b) subjecting the said mixture to a shear greater than 10 sec^{-1} to dissociate all or a portion of said platelet particles to form particles having an average thickness of less than 5nm (50Å) and a maximum thickness of 10nm (100Å) and to disperse said platelets uniformly in said polymer."

The remaining dependent Claims 2 to 6 related to elaborations of the composite material of Claim 1.

According to a further letter of the Patent Proprietor dated 18 October 2002, these claims were replaced by five new sets of claims which were filed to form the new Main Request and first to fourth Auxiliary Requests. In this new Main Request (referred to herein below as the "2002 request"), "(a) the wording of the definition of the heterocyclic ring constituted by R₂ and R₃ has been restored to the form occurring in the text of the Patent as granted, (b) certain of the definitions for the substituents have been omitted, and the possibility that the possibility of R₂ and R₃ being alkoxyaryl has

been replaced by the possibility that they may be alkoxyphenyl. The latter possibility is based on its mention at page 13 line 1 of the printed specification of the Patent as granted." (page 1, last paragraph of the letter). The Auxiliary Requests were even further limited.

Moreover, in Claim 1 of each of these requests, the chemical formula $-(\text{CH}_2\text{CHR}_9\text{Z})_q\text{-R}_8$ was offered as a replacement of the original formula $(-\text{ZCH}_2\text{-CHR}_9)_q\text{-ZR}_8$. The latter formula had been agreed by all parties as being "manifestly erroneous" (No. II of the reasons of the decision).

These requests formed the basis for the decision of the Opposition Division.

III. In the decision orally announced at the end of oral proceedings on 18 December 2002 and issued in writing on 24 January 2003, the patent was revoked, because Claim 1 of each of the above requests had been amended in a way for which it had not been evident that nothing else would have been intended than what had been offered as the correction. Rather, three alternatives for conceivable corrections of the above erroneous formula were identified in the decision, ie

- a) $-(\text{CHR}_9\text{Z})\text{R}_8$,
- b) $-(\text{CH}_2\text{-CHR}_9)_q\text{ZR}_8$ or
- c) $-(\text{CH}_2\text{-CHR}_9\text{Z})_q\text{R}_8$,

the latter two of which were considered by the Opposition Division as being realistic alternatives to the old defective formula.

Consequently, in the Opposition Division's view, the above amendment carried out in Claim 1 of each of the requests then on file did not fulfil the second requirement of Rule 88 EPC, so that none of the requests could "lead to a patent which meets the requirements of Article 123(2) EPC", and the patent in suit was revoked.

IV. On 24 March 2003, a Notice of Appeal was filed against this decision by the Patent Proprietor/Appellant, who requested that the decision under appeal be reversed in its entirety and the patent in suit be maintained on the basis of the "2001 request" (section II, above). The prescribed fee was paid on the same date. The Statement of Grounds of Appeal was received on 23 May 2003, in which the above request was modified in that "the Case should be referred back to the Opposition Division in order that the Claims constituting the Main Request and, if necessary, those of one of the Auxiliary Requests should be assessed for novelty and inventive step."

In substance, the Appellant disputed the finding in the decision under appeal concerning the admissibility under Rule 88 EPC of the amendment proposed by the Patent Proprietor in its letter of 18 April 2001.

In its letter dated 9 October 2003, Opponent 01/ Respondent 01, however, supported the decision, namely the finding in respect of the suggested correction of the defective formula in Claim 1 of the patent in suit (cf. sections II and III, above) and additionally commented in an annexed "Attachment to Response Letter"

on further issues of the case, including the questions of novelty, inventive step and Article 84 EPC:

"In this regard, a close review and comparison of (i) the original claims disclosed in WO 93/04117, (ii) the granted claims of the Patent and (iii) the proposed claims of each of the Patentee's Requests is warranted, in order to appreciate how the main claim has been narrowed as a result of each new prior art reference cited against the claims. In particular, it is emphasized that the original description provides no suggestion or teaching that the presently narrowed scope of the Patentee's Requests is in any way described as an 'invention' in the original description. Instead, each of the Patentee's Requests proposes claims that are merely an assortment of elements apparently selected solely to avoid the crowded prior art in this field without any basis for concluding that the Patentee originally intended such a scope of 'invention.'

In other words, claim 1 of the Main Request, as well as each of the Auxiliary Requests I-IV, are certainly undisclosed combinations as compared to the original description of WO 93/04117, because the original description provides no direction that would lead a skilled person to view any of Patentee's Requests to have been originally intended as inventive subgroups of the unduly broad original claims and disclosure. However, it should be understood that, while the claims of each of Patentee's Requests appear to be quite novel combinations as compared to the original disclosure of WO 93/04117, ...

The Patentee appears to have merely excised known species of their claims when each new prior art

reference was identified during the examination and opposition phases without any consideration as to whether the resulting narrowed claims provide a cohesive invention based upon evidence of inventive step. In other words, a skilled person could find no direction in the original description that any of the claim scopes currently recited in the Patentee's Requests embody an originally intended invention."

In a letter dated 31 October 2003, Respondent 03 supported the arguments of Respondent 01 and requested the dismissal of the appeal.

By letter of 10 May 2005, Respondent 01 requested to be informed when the case would be handled.

- V. Together with the summons to oral proceedings, the Board, on 20 June 2005, issued a communication giving a provisional, preliminary view on the matters which would be considered in these oral proceedings, ie the questions of Articles 100(c), 123(2) and 123(3) EPC.

Auxiliary requests had only been filed together with the "2002 request", but not with the "2001 request" (see section II, above). Therefore, in view of the Notice of Appeal, it was unclear which of the above two main requests was meant in the Statement of Grounds of Appeal, and the Appellant was asked to clearly identify those sets of claims, which were further pursued.

The attention of the parties was also drawn to the arguments of Respondent 01 supporting the decision under appeal, according to which different conceivable alternatives existed for the erroneous chemical formula

$(-ZCH_2-CHR_9)_q-ZR_8$ (sections I and III, above), none of which could *prima facie* be considered as being unreasonable or unlikely.

Furthermore and with reference to examples therefor, mention was made of the fact that it had not been evident that all the individual definitions in Claim 1 of those requests on file had a clear basis in the application as originally filed, and that it would be indispensable for the Appellant to identify the clear and unambiguous basis for each definition in the original text as published in WO-A-93/04117. As (not exhaustive) examples for the facts mentioned above, reference was then made to the open range "equal to or greater than 10 mmole of said species/100g of particles" in the first paragraph of feature (b) and to the term "alkenyl oxide" in Claim 1 of the "2001 request" and the "2002 request", respectively.

Finally, a time limit was set for any written submissions by the parties with reference to Article 11 RPBA and Rule 71a EPC.

- VI. In a letter dated 29 July 2005, Respondent 03 referred to positions of the Appellant concerning the correction of the erroneous formula in the proceedings before the EPO and the USPTO as being inconsistent with each other, and it identified even further, in its view, conceivable alternatives for the suggested correction of the above chemical formula in question and filed three further documents to support its assertion.

Additionally, it informed the Board that it would not attend the oral proceedings and requested further, that, if the decision under appeal was set aside by the Board, the case should be remitted to the Opposition Division for the assessment of novelty and inventive step.

By letter dated 5 August 2005, the Appellant confirmed that it would maintain the "2001 request" as the Main Request (section II, above), and replaced the previous auxiliary requests by four new sets of claims as Auxiliary Requests I to IV, which will be referred to herein as the "August 2005 requests". However, the Appellant failed again to provide any information concerning the basis of the features in the new claims in the WO-A-publication.

Respondent 02, in its letter dated 19 August 2005, stated that it would not attend the oral proceedings and requested that the "August 2005 requests" should not be admitted as not compliant with Article 10(a)(2) of the Rules of Procedure of the Boards of Appeal (RPBA; OJ EPO 2003, 89).

On 6 September 2005, Respondent 01 informed the Board that it would take part in the oral proceedings and would be prepared to discuss all issues of the case, and that it would argue against the consideration of the requests of the Appellant and Respondent 03 possibly to remit the case to the first instance.

VII. Oral proceedings were held on 8 September 2005 in the presence of the Appellant and of Respondent 01.

- (a) The parties were informed at the beginning of the hearing that Article 10(a)(2) RPBA, referred to by Respondent 02 (section VI, above), does not, according to the decision of the Presidium of the Boards of appeal dated 28 October 2002, Article 2 (OJ EPO 2003, 62), apply to this appeal, since the Notice of Appeal was received before 1 May 2003.

With regard to the case, it was observed that the Appellant had still failed to provide any information to demonstrate that the amendments in Claim 1 of the pending requests, including those exemplified in the communication (section V, above), comply with Article 123(2) EPC.

Additionally, a provisional, preliminary remark was made by the Board, concerning the fact that each of the "August 2005 requests" additionally contained a new Claim 7:

"Composite material according to Claim 1 wherein Z_1 is -O- or --NR₁₃-, wherein R₁₃ is hydrogen or alkyl having from 1 to 4 carbon atoms.",

which gave rise to the questions of whether it complied with Rule 57a EPC in view of the broader definition of Z_1 in Claim 1 of each of these requests and which objection was to be met by means of this claim in comparison with the Main Request.

- (b) When having been given the floor, the Appellant gave notice that it would like to replace all the admittedly defective sets of claims of all the

pending requests by a new Main Request and new Auxiliary Requests I and II. If, however, the Board did not admit these new requests, it would then maintain the "2001 request".

- (c) Respondent 01, however, disputed the admissibility of the "August 2005 requests" and of any further new requests at this late stage of the proceedings, because no good reasons for their delayed filing had been given by the Appellant. The opponents, on the other hand, had already addressed, in their respective Notices of Opposition, all the deficiencies of the patent in suit and had then, in the course of the opposition proceedings, presented all their further arguments including those to all substantive issues. Thus, the opponents had done everything to deal with any request in time, whilst the Patent Proprietor had only filed new requests again and again, all of which were, nevertheless, defective and contained the erroneous chemical formula or its questionable replacement. In other words, the Patent Proprietor had done nothing which would have allowed to deal with the substantive questions of patentability in due time before the Opposition Division.

Now, even after seven years of opposition and appeal proceedings, nothing had yet be done by the Appellant to remove the deficiencies from the claims on file. Instead, in the Respondent's view, the Appellant intended to continue to file new requests of different scope, which gave rise to new aspects additionally requiring examination under Articles 84 and 123(2) EPC. This would,

however, mean that the workload is shifted to the Board and the Respondents, and this would amount, in the Respondent's opinion, to an abuse of the procedure by the Appellant. In support of this point of view, the Respondent specifically referred to T 382/96 of 7 July 1999 (not published in OJ EPO; in particular, to Nos. 5.2 and 5.5 of the reasons).

In summary, neither the "August 2005 requests", nor any new requests presented in the oral proceedings should be admitted, nor should the case, under all circumstances, be remitted to the Opposition Division.

- (d) The only excuse for the late filing, presented by the Representative of the Appellant, was that he, personally, had been appointed in this case only shortly before the time limit set in the communication of the Board. Additionally, he argued that the Respondents, in view of the course of the procedure so far, could not have expected that these oral proceedings would be the last step in the proceedings dealing with the oppositions.

- (e) The Chairman expressed the doubts of the Board that an abuse of procedure could be established and informed the parties that the Board would take a look at the suggested new requests. This would not, however, prejudice any decision of the Board on their admissibility. Rather, when deciding on this question with regard to any late-filed request, the Board would take into account, that there had been a conspicuous lack of response from

the side of the Appellant to remedy the deficiencies of the requests already on file and that this lack of response had prevented a converging procedure, ie to deal with this case efficiently. Thus, the Appellant had failed so far to meet even those requirements put forward to it in a clear and unmistakable manner in the communication of the Board. In particular, the lateness of the filing of the requests thereafter without convincing explanation or excuse would also be taken into account. Furthermore, the Chairman raised the question of why the Board should take any requests into account, which were defective as conceded by the Appellant.

In reply to the additional question in which sequence the requests suggested by the Appellant should be considered, the Appellant stated that it withdrew all the "August 2005 requests" (section VI, above, paragraph 3) and that it would further pursue only the new Main Request, the new Auxiliary Requests I and II, followed by the "2001 request" as the lowest ranking auxiliary request.

- (f) The sets of claims according to the new requests (see section VII(b), above, and the previous paragraph) were then submitted by the Appellant. According to the Appellant, these new requests had been prepared on the basis of the "2001 request" and of Auxiliary Requests 2 and 4 of 5 August 2005. They had in common a feature inserted into paragraph (b) of Claim 1 (quoted in section II, above) between the statements "10 mmole of said species/100g of particles," and "said chemical

species being selected from onium compounds of the formula ..." and reading as follows:

"wherein the resulting platelet particles are lipophilic and have a surface tension at 20 degrees Centigade [*sic*] of less than or equal to 5.5N/cm,".

Moreover, each of the new sets of claims also contained the new Claim 7, already addressed with regard to the "August 2005 requests" (paragraph 3 of section VII(a), above). Furthermore, in Claim 1 of the new Main Request and in Claim 6 of all the new requests, the feature "completing a ring" (cf. section II, above) had been replaced by "which, together with the nitrogen to which they are attached, completes a heterocyclic ring,".

In support of these requests, the Appellant referred to the following parts of the original text as published in WO-A-93/04117: Claim 5; page 13, line 4 and page 14 in support of the amendments of R₂ and R₃; page 5, line 3 mentioning the melt processing temperature; page 12, line 36 showing the formulae of the onium compound species; page 19, lines 12 to 14 concerning the "resulting platelet particles"; page 20, line 35 referring to the amount of the "onium chemical species"; page 24, line 7 disclosing the minimum amount of component (b). Moreover with respect to the new Auxiliary Request II, reference was made to page 18, lines 10 to 27.

- (g) As regards the measurement of the surface tension of the "resulting platelets particles", the Appellant argued that the term "derivatized particle" on page 19 and the method of measurement as disclosed on page 35, first paragraph, made it clear that the surface tension, as defined in Claim 1, was related to the derivatized particles prior to incorporation in the composition and was determined by measuring the contact angles of a liquid at the surface of these derivatized particles (page 38, Example 1).

The Respondent, however, observed, that Claim 1 of each of these new requests was rendered unclear by this additional feature. According to Claim 1, the new feature was a characteristic of the claimed product *per se*. This was, however, inconsistent with the Appellant's statement concerning the measurement of this feature on a starting material. Since this would, however, constitute a transfer of a feature of a starting material to a feature of the product, the new claim would also violate Article 123(2) EPC.

These opposing views of the parties gave rise to a question about the meaning of the word "resulting" in "the resulting platelet particles" as defined in component (b) of the composite material.

- (h) Concerning the key issue of the decision under appeal, ie the proposed correction of the chemical formula in Claim 1 (sections II and III, above), the Appellant referred to the following formulae

(2) to (4) as being conceivable replacements for the erroneous formula (1) in the patent in suit:

- (1) - $(ZCH_2-CHR_9)_qZR_8$,
- (2) - $(CH_2-CHR_9)_qZR_8$,
- (3) - $(CH_2-CHR_9Z)_qZR_8$ and
- (4) - $(CH_2-CHR_9Z)_qR_8$.

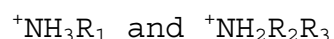
Formula (3), like formula (1), would, however, refer to unstable compounds (containing N-N- or N-O-bonds) and formula (2) would not cover the substituents listed on pages 13/14 of the WO-A-publication, whereas formula (4) would do. Therefore, formulae (2) and (3) would immediately be recognised by the skilled reader to be incorrect, leaving only formula (4) for the correction in compliance with Rule 88 EPC, which should, therefore, be allowed.

- (i) By contrast, Respondent 01 further supported the decision under appeal in respect of the above suggested correction and, furthermore, confirmed its previous statements concerning the definitions of R_1 , R_2 and R_3 in its letter dated 9 October 2003 (section IV, above, paragraph 3 *et seq.*), ie that selections, contravening Article 123(2) EPC, had been made. This was, in the Respondent's view, compounded by the fact that the patent in suit had exemplified only a sole onium compound, ie dipentyl ammonium in one example.
- (j) Before interrupting the proceedings for deliberation concerning the admissibility of the new requests and, in view of the fact that all

questions having led to the decision under appeal had been discussed, possibly also the final decision, the Chairman asked the parties whether they wished further to comment on the above issues. Both answered in the negative. Then when asked for the requests which it wished to pursue further, the Appellant withdrew the Main Request and Auxiliary Request I, both as submitted during the oral proceedings, and confirmed that the "August 2005 requests" had also been withdrawn.

VIII. Consequently, it was established that only the new Auxiliary Request II filed in the oral proceedings and the former Main Request as submitted with the letter dated 18 April 2001, ie the "2001 request" (section II, above) remained pending. Claims 1, 7 and 8 of the new Auxiliary Request II read as follows:

"1. A composite material comprising:
(a) a polymer matrix comprising a melt processible polyamide polymer having a melt processing temperature equal to or greater than 220°C, and
(b) from 0.001 to less than 60% by weight, based on the composite material, of dispersed platelet particles having an average thickness of less than 5nm (50Å) and a maximum thickness of 10nm (100Å) and having an onium chemical species bonded to them in an amount equal to or greater than 10 mmole of said species/100g of particles, wherein the resulting platelet particles are lipophilic and have a surface tension at 20 degrees Centigade [*sic*] of less than or equal to 5.5N/cm, said chemical species being selected from onium compounds of the formula



wherein R_1 has at least 12 aliphatic carbon atoms, and R_2 and R_3 are the same or different and are organic radicals having at least 5 carbon atoms, and wherein R_1 , R_2 and R_3 are selected from cycloalkyl, cycloalkenyl, cycloalkynyl, alkyl, alkenyl or alkynyl or a moiety of formula $-R_{11}-Z_1-R_{12}-$, or R_2 and R_3 together form a divalent moiety of the formula

$-R_{11}-$, $-R_{11}-Z_1-R_{11}-$, or $-R_{11}-Z_1$

which, together with the nitrogen atom to which they are attached, completes a heterocyclic ring, wherein R_{11} is alkylene, cycloalkylene, cycloalkenylene, alkylenylene [*sic*], or alkynylene;

R_{12} is alkyl, alkylaryl, alkoxyaryl, alkenyl, alkynyl, aryl, cycloalkyl, or cycloalkenyl, and

Z_1 is $-O-$, $-NR_{13}-$ or $-^+N(R_{13})_2-$, $-S-$, $-S(O)_2-$, $-OC(O)-$ or $-N(R_{13})C(O)-$ and

R_{13} is hydrogen or alkyl having from 1 to 4 carbon atoms."

"7. Composite material according to Claim 1 wherein Z_1 is $-O-$ or $-NR_{13}-$, wherein R_{13} is hydrogen or alkyl having from 1 to 4 carbon atoms."

"8. A process for forming a composite material according to any one of Claims 1 to 7, said process comprising the steps of

(a) forming a flowable mixture comprising a melt of the polymer at a temperature equal to or greater than 220°C and a swellable material comprising intercalated layer aggregates of platelet particles having an onium species as defined in Claim 1 bonded to the surface of the particles in an amount of at least 10 mmole of species/100g of particles, said platelet

particles being present in an amount of from 0.001 to less than 60% by weight of said composite material, and (b) subjecting the said mixture to a shear greater than 10 sec^{-1} to dissociate all or a portion of said platelet particles to from particles having an average thickness of less than 5nm (50Å) and a maximum thickness of 10nm (100Å) and to disperse said platelets uniformly in said polymer."

Respondent 01 requested that the appeal be dismissed. In the course of the written proceedings, Respondent 02 had also requested that the appeal be dismissed (letter dated 19 August 2005) and Respondent 03 had requested that the decision under appeal be confirmed and that the patent in suit be revoked on the basis of the state of the file (letter dated 29 July 2005).

Reasons for the Decision

1. The appeal is admissible.
2. Since all the parties had duly been summoned, the proceedings were continued in accordance with Rule 71(2) EPC in the absence of Respondents 02 and 03.
3. *Admissibility of Auxiliary Request II filed in the oral proceedings*
 - 3.1 This request has been submitted for the first time in the oral proceedings on 8 September 2005, after
 - the Opposition Division had decided on 18 December 2002 that the correction of the chemical formula was not allowable (section III, above);

- the Appellant had maintained requests, all of which had been filed in advance of the decision under appeal (ie the "2001 request", the "2002 request" and the auxiliary requests filed therewith; section IV, above);
- in the letter dated 9 October 2003, Respondent 01 had objected to the narrowed scope of these requests, which, in its view, did not have a basis in the originally filed text (section IV, above, paragraph 3 *et seq.*) and
- the statement in the communication of the Board of 20 June 2005 that it would be indispensable for the Appellant to identify the clear and unambiguous basis for each definition in the original text as published, and the time limit for any written submissions set in the communication (section V, above). The Appellant did not, however, reply in a complete manner to this communication, but filed claims which were admittedly defective (section VII(b), above).

3.2 Moreover, Rule 57a EPC defines the requirements for admissibility of amendments of the patent specification: the amendments must be "occasioned by grounds of opposition specified in Article 100 EPC".

Although, initially, the attention of the parties had been drawn to this Rule and also to the Board's view that Claim 7 of the "August 2005 requests" had not met the above requirement (section VII(a), above), the new Auxiliary Request II, filed thereafter, nevertheless, contains a Claim 7 of identical scope. It follows that the above requirement of Rule 57a EPC is not met by this request either, as can be seen from the broader

definition of Z_1 in Claim 1, to which Claim 7 is appendant. The correctness of this finding was conceded by the Appellant.

3.3 Furthermore, the Respondent had drawn the attention of the Board and of the Appellant to the fact that the conversion of the surface tension of 55 dyne/cm to 5.5 N/cm in Claim 1 was incorrect. According to literature, the conversion factor is 10^{-5} . The Appellant declared that it would return to the originally disclosed value. Such a claim would, however, contravene Rules 61a and 35(12) EPC.

3.4 In particular and in view of the above facts and findings, as well as the further facts and arguments also discussed during the oral proceedings (section VII(c) and (e) to (g), above), the only explanation for the late submission of this requests (section VII(d), above) is completely unsatisfactory.

3.5 Nor can the Board, in view of the conspicuous lack of response from the side of the Appellant to remedy the deficiencies of the patent in suit in good time (cf. section 3.1, above), permit the late filing of this request, which would otherwise amount to an unequal, if not unfair treatment of the Respondents.

Reference is made to the "Guidance for parties to appeal proceedings and their representatives" (OJ EPO 1996, 342), No. 3.3 ["... A party wishing to submit amendments to the patent documents in appeal proceedings should do so as early as possible. It should be borne in mind that the board concerned may disregard amendments which are submitted after a time

limit set by the board has expired or are not submitted in good time prior to oral proceedings (as a rule four weeks before the date set for the oral proceedings).

Auxiliary requests should be filed as early as possible."] and No. 3.5.5 ["The parties should provide all relevant information and documents in good time, ie at the latest one month before the hearing (see Art. 11(1) Rules of Procedure of the Boards of Appeal)."] and to Article 11(1) RPBA, (old version, OJ EPO 1983, 7): "If oral proceedings are to take place, the Board concerned shall endeavour to ensure that the parties have provided all relevant information and documents, before the hearing." (cf. section VII(a), above).

3.6 Consequently, the Auxiliary Request II filed during the oral proceedings is not admitted into these appeal proceedings.

4. *Main Request as submitted with the letter of 18 April 2001 (the "2001 request")*

4.1 As already pointed out above (sections VII(b), VII(e) and 3.1, above), the Appellant conceded that all the requests on file at the beginning of the oral proceedings were defective. It follows, that this statement has also been valid for the "2001 request", ie, admittedly, it does not comply with the EPC. Nevertheless, the Board adds the following observations which corroborate this assessment by the Appellant.

4.2 Whilst Claim 1 as granted did not differentiate the groups R_1 , R_2 and R_3 in respect of their chemical types, but only with regard to their minimum chain lengths

(section I, above) and was consistent, in this respect, with the original disclosure on page 13, line 12 to page 14, line 31 and page 18, lines 10 to 14 of the WO-A-publication, the scope of the primary ammonium compounds containing R_1 in Claim 1 of the "2001 request" has clearly been restricted far more than the secondary ammonium compounds with R_2 and R_3 .

- 4.2.1 R_1 has been limited in Claim 1 to a single type of residue of the formula " $-(CH_2-CHR_9Z)_q-R_8$ ", having at least 12 aliphatic carbon atoms, whilst R_2 and R_3 , besides residues in accordance with the definition of the above formula, still encompass more than twenty other definitions. Thus, the primary ammonium compound $^+NH_3R_1$ has been limited to one type of compound.

However, the list of definitions of R_2 and R_3 has also been amended, on the one hand, by deletion of aryloxy-alkyl, aryloxyaryl, arylaminoalkyl and diarylaminoalkyl initially included in the formula $^+NH_2R_2R_3$ and, on the other hand, by addition of alkoxyaryl, which has neither a basis in the original, published application (it was mentioned there as one option for R_{12}), nor in the patent in suit as granted, contrary to Article 123(2) and (3) EPC.

- 4.3 Apart from the deficiencies mentioned above, Claim 1 includes two lists of, partially wrong and inconsistent, definitions of R_{11} (Article 84 EPC) and, furthermore, differs (cf. sections I and II, above) from its granted version by the chemical formula, which had been the reason for the revocation of the patent in suit by the Opposition Division:

4.3.1 In the patent in suit, the above admittedly defective chemical formula had read " $(-ZCH_2-CHR_9)_q-ZR_8$ " (section I, above), and the Opposition Division had seen, in the decision under appeal, three conceivable alternatives for amendment of this formula, so that the conditions of Rule 88 EPC (2nd sentence) for a correction of the specification were not fulfilled. Thus, two of the three conceivable alternatives had been considered in the decision under appeal as being realistic alternatives to the above admittedly defective formula. (section III, above).

During the oral proceedings before the Board, the Appellant referred also to three formulae (2) to (4) (section VII(h), above), two of which would, however in its view, immediately be recognised by a skilled person as being incorrect.

Whilst the formulae (2) and (4) corresponded to formulae b) and c), respectively, mentioned in the decision under appeal, formula (3) referred to by the Appellant had no antecedent in the decision under appeal nor in the letter dated 29 July 2005 of Respondent 01 (cf. sections III and VI, above).

Even if formula (3) is disregarded just for the sake of argument, thereby taking the Appellant's arguments for granted, that it referred to unstable compounds only, there are still two options left (formulae (2) and (4)).

The argument, that formula (2) would be recognised as being incorrect, because it did not cover the substituents listed on pages 13/14 of the WO-A-publication (section VII(h), above), is, however, not

convincing, because the formula in question (page 14, lines 24 to 31 of the WO-A-) relates to one example within the long list of meanings of groups R_1 to R_7 listed on from page 13, line 12 to page 14, line 31 of the publication, and represents, thus, just one alternative equivalent to those other moieties in this list. It is, therefore, not to be expected *a priori* that other members of the list would necessarily fall within the scope of this formula; rather the contrary.

- 4.3.2 In view of these facts and findings, the Board cannot concur with the above arguments of the Appellant. Rather, in agreement with the Respondents, the Board has no reason to deviate from the respective conclusion of the Opposition Division in the decision under appeal (No. III of the reasons), that the requirement in the second sentence of Rule 88 EPC is not fulfilled (section III, above).
- 4.3.3 Furthermore, the definitions of the "onium compounds" in the last paragraph of the claim includes the substituent "alkenyl oxide" as already mentioned in the communication of the Board (section V, above). This meaning, which may be a clerical error, but remained uncorrected, has no basis in the patent as granted nor in the published application (Article 123(2)/(3) EPC).
- 4.3.4 As stated in T 382/96 (above; No.5.2 of the reasons), it is a basic principle of the European patent law, that it is the Applicant/Patent Proprietor who is responsible for the definition of the claimed subject-matter. This responsibility cannot be transferred *de facto* to the EPO, in this case to the Board of Appeal,

nor to the Respondents, to find out on their own, whether Article 123(2)/(3) EPC is complied with.

In the present case, the Appellant has, in fact, repeatedly tried such a transfer in the course of the written opposition and appeal proceedings, when it filed new requests without identifying the basis in the published application text for the various definitions and amendments, respectively, in the claims as required by the Board (section V, above). If it had met this requirement, at least a number of the above deficiencies might have been remedied or avoided.

- 4.4 Consequently, in view of the findings in sections 4.2.1, 4.3.2 and 4.3.3, above, the Board has come, in the present circumstances, to the conclusion that Claim 1 of this request violates Article 123(2) and (3) EPC.

Since a decision can be made only on a request as a whole, there is no need to go into the further remaining claims of the request.

- 4.5 Consequently, the "2001 request" cannot, for the reasons given above, be successful and the decision under appeal must be upheld.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

R. Young