

Examiners' Report on Paper A (Chemistry 1991)

The task with which the candidate was presented was, superficially, simple. However, to achieve a scope of protection which the Examiners considered adequate required detailed consideration of the information provided by the client.

A number of candidates directed their first claim, or a subsequent independent claim, to a process for the production of polyimides. Most of them had correctly specified in such a claim that the polyamide acid obtained as an intermediate product by the reaction of the specific diamines and dianhydrides, indicated in the client's letter, was converted to polyimide by a treatment with an anhydride of a lower aliphatic monocarboxylic acid. Such process claims provided the client with good protection for this aspect of the invention.

A small number of the candidates who presented a claim of this type specified the treatment of the intermediate polyamide acid product with an unspecified dehydrating agent, or an anhydride of an unspecified acid, whilst the client had only reported on the use of an anhydride of a lower aliphatic monocarboxylic acid. Other candidates directed the claim to the treatment of a broad range of polyamide acids resulting from the reaction of unspecified dianhydrides with unspecified diamines.

Claims with such a broad scope, not supported by the information given in the client's letter, were regarded as too vague and, consequently, did not attract many marks. The same remark applies to claims relating to the production of polyimides of an almost arbitrary category, which were presented by a few candidates. The clients had, after all, only studied specific thermoset cross-linked polyimides.

A small number of candidates drafted the first claim as a "product by process" claim directed to thermoset cross-linked polyimides "obtainable" by the process as described in the client's letter. Such a claim in its broad scope was regarded not admissible because the product, the polyimide in question, could not be held to be novel. There was no evidence that the polyimides obtained by the new production method were chemically different from the prior art polyimides.

However, this generality does not apply to those polyimides, and even the polyamide acid, prepared using a diaminodiphenyl sulphide or -sulphone as an aromatic diamine, since these were not only new over the prior art, but were inventive thereover since the polyimides displayed outstanding tensile strength which was higher than those of other polyimides. Protection could therefore be claimed for this type of product, in particular polyimides and to articles made from these specific diamines, for instance in a claim drafted in the product "obtainable by" manner. The possibility of such claims was only correctly appreciated by a few of the candidates.

Some candidates, probably aware of the non-admissibility of a broad polyimide product claim, entered a disclaimer in the polyimide claim so as to exclude, as a diamine, the use e.g. of diamino-diphenyl ether, m- and p-phenylenediamine or even of pyromellitic acid, already exemplified in the prior art documents, even at the expense of disclaiming the client's examples. No inventive step however could be put forward for such a claim which, therefore, must be regarded as not allowable. The same objection applies to claims for polyamide acid solutions with a disclaimer for the same type of compounds.

From the information given by the client it was clear that the client's main interest resided in getting a protection for shaped thermoset polyimide articles. This was appreciated by a number of the candidates. In addition to the process claims therefore claims had also been drafted, either as process or product claims, directed to shaped polyimide articles, whereby the shaping step was performed prior to the conversion into the polyimide. Preferably the candidates' main claim should be directed to the production of shaped articles, together with a claim to a process for the production of the polyimides.

Whilst most candidates had dependent claims for the manufacture of polyimide films, a great number of these candidates had omitted to draft a claim explicitly and clearly claiming the manufacture of microporous films having an asymmetric structure as a result of the immersion of a coated support in the anhydride bath.

Hardly any candidate had realised that the said microporous polyimide film with an asymmetric structure could properly be claimed as a product "obtainable" by the method as described in client's letter. A membrane with such a structure was basically new over the cited prior art. The failure to have such a claim resulted in a loss of marks.

A small number of candidates did, indeed, have an independent claim for a membrane with an asymmetric structure. However, they had not specified in any way the material constituting the membrane or the production process. Such a broad claim was regarded not allowable.

A number of candidates correctly had a claim for the coating of substrates with a solution containing less than 15% by weight of polyamide acid which was subsequently converted to polyimide. Points were nonetheless lost because of rather imprecise drafting of some of these claims.

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A number of candidates also had a claim for the use of a polyimide film as a semipermeable membrane in the reverse osmosis and similar separation processes. Most of these candidates, however, had not properly limited the claim to the use of a microporous film with an asymmetric structure as indicated in client's letter.

In general points were lost by most candidates because they had failed to produce all the claims of the type mentioned above or because the way the claims were formulated made them not fully acceptable.

A certain number of points were awarded to most candidates for the identification in subsidiary claims of preferred features of the invention. Subject-matters for which points could be gained were more particularly:

the preferred conditions under which the reaction was carried out;

the defining of the anhydride of the lower aliphatic monocarboxylic acid, of the diamine (definition of the aromatic radical R1) and the dianhydride;

the addition of a diluent;

the addition of a tertiary amine as a catalyst and of the preferred amines.

The rewriting of the information contained in the client's letter to serve as a description for a patent application, was carried out with varying success.

Not many points could be given to a description wherein there was a lack of conformity between the text and the main claims. Points were also lost when it was fairly unclear to what extent the invention as defined in the main claims provided a solution to a technical problem outlined in the description.

# EXAMINATION COMMITTEE I

Candidate No. ....  
 Report by examiner No. ....

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FORM, for use by individual examiners, in PAPER A (Chemistry)

## Schedule of marks

Category	Maximum possible	Individual marks awarded	Where <b>grades</b> awarded are not identical	
			Revision of marks/grade (if any)	Remarks*
Claims:				
- Scope of protection = independent claim or claims	22			
= dependent claims	15			
- formal requirements	3			
Description: (Title, field and prior art, problem and/or discovery, solution and advantages)	8			
TOTAL	48			
CORRESPONDING GRADE				

### Translation of marks into grades

	Grade
0 - 11	7
12 - 17	6
18 - 23	5
24 - 29	4
30 - 35	3
36 - 41	2
42 - 48	1

\* to be filled in if both the following requirements are fulfilled:

- the grades awarded by the two individual examiners before their discussion differ by two grades or more;
  - the marks awarded by at least one of the two individual examiners have been changed during their discussion.
- If remarks are to be filled in, they should briefly explain **why** the examiner has changed his marks.