Examiners' Report on Paper A/1997

Claims to a process for the preparation of compounds or emulsifiers by reaction of *para*-C_6- to C_{24}-alky phenols in two consecutive reactions (**a**) and (**b**) in either order were expected.

Reaction (**a**) was the oxyalkylation with an alkylene oxide of the formula $\mathbf{R^1O}$ as defined in the letter or in other words with ethylene oxide, propylene oxide and/or butylene oxide at temperatures of 100 to 150°C and a molar ratio of the oxide to the substituted benzene of 2 to 10. This reaction was explained in paragraph 3 on page 4. In this passage reference was also made to the fact that this reaction had already been known from **Document I**. Despite the fact that the reaction as such was known in the art, it was considered necessary to specify all the essential features necessary to define the invention in the process claim.

Reaction (**b**) was referred to as sulphonation, i.e. the reaction with a sulphonating agent followed by immediate neutralisation (page 6). Reference is made in the last paragraph on page 4 to **Document II**. A number of candidates did not realise that the neutralisation was not a separate third reaction step (**c**) to be carried out as the final step of the process, but that it had to be carried out at the end of the sulphonation reaction (**b**).

It was also expected that the new compounds per se were claimed, obtainable in this process (by carrying out the two above reactions. The client characterised them as being versatile, because they combine the advantageous properties of both classes of emulsifiers referred to in **Documents I** and **II**. The product claim was expected to be worded in the form of a product-by-process claim. The product was **not** expected to be defined by a chemical formula, because the information provided by the client was obviously very poor (see also paragraph 3 of the Instructions to Candidates). Moreover, the client clearly indicated that the starting compounds and the reactions carried out should be sufficient to characterise his compounds. That the products were somewhat varied could be seen from the different properties referred to in the description and demonstrated in the examples (in particular see example 3, e.g. the differences in the thermal and chemical stability of samples a and b compared to e and f, the second paragraph on pages 9). This appears to indicate that one chemical formula could not cover the whole range of products.

Some candidates demonstrated that they were not familiar with the office practice which is based on case law and which is explained in the Guidelines C-III, 4.7b concerning product-by-process claims.

The candidates were expected to classify the features correctly with respect to process features (in the process claims) and to product features (in the product claims).

Further claims were expected to the use of these compounds in four technical fields: tertiary oil recovery, building industry, polymerisation and polymer fibre and yarn industry. Properly worded use claims or method claims and/or product claims covering this aspect of the invention were given credit. The main aspects of the invention were of course the compounds per se and the process for their preparation which give the broader protection.

In addition to these categories of one invention, comments were expected covering a further... the client's letter. The letter repeatedly referred in clear terms to the advantages of carrying out t... phonation reaction using sulphur trioxide instead of concentrated or fuming sulphuric acid. In view... this information, it was expected that the candidates were aware of the possibility of directing a claim... to the sulphonation reaction alone based on the use of sulphur trioxide. This fact required considerations about unity: as explained in the Guidelines C-III, 7, in particular in C-III, 7.2 and 7.7, unity requires that the special technical feature(s) common to all inventions considered as a whole make(s) a contribution over the state of the art, i.e. it/they must be new and inventive.

If the claim relating to the sulphonation reaction with sulphur trioxide was not limited to the particular C_6- to C_{24}-alkyl phenols and the claim to the above two-step process was not limited to sulphur trioxide, then there was lack of unity. In other words, the "special technical feature" common to these two processes could be either the common range of C_6- to C_{24}-alkyl phenols or the sulphur trioxide.

Concerning the two-step process, claims limited to the use of sulphur trioxide and claims referring to the use of a sulphonating agent in general were equally treated in view of the description in the client's letter. There, it was mentioned that the use of sulphur trioxide was "more advantageous" than the use of sulphuric acid, but it was, on the other hand, pointed out that "the old processes [using sulphuric acid] are not of interest ... and will probably soon have to be completely replaced".

A claim to the use of *para*-alkyl phenols in the preparation of emulsifiers could not gain marks in view of the last paragraph of **Document I** and the description of this reaction on page 4 where it is admitted that the oxyalkylation reaction and its products were known from that document.

It was expected that description and claims be consistent. Thus, if a temperature was given as not to be exceeded but the claim was silent in this respect, a loss of marks was the result. On the other hand, features referred to in the letter as being preferred should not have been made a mandatory feature in an independent claim.

If further parts of Paper A were intended to form a part of the introduction of the description as referred to in the Instructions to Candidates, a short indication was expected.

Some candidates formulated sets of claims containing more than 20 claims wherein each and every range disclosed was mentioned. The candidates should be aware that only a limited number of marks is available for dependent claims. Dependent claims should also be restricted to a reasonable number for reasons of economy, and to satisfy the requirement of Article 84 EPC.

A number of candidates did not pay attention to the fact that features must be properly defined either in the claim itself or in a claim to which this claim is appendant. Thus, it was sometimes not clear which temperature was meant or which feature was defined by a given range.

Some candidates drew up claims to each and every process feature separately and were unaware that

the client's letter required under particular circumstances, particular feature combinations. Thus, th the letter clearly stated that neutralisation was to be carried out directly after the sulphonation reacti (irrespective whether sulphonation was the first or second reaction stage), some candidates referred to it in a dependent claim only as a further reaction stage.

Some candidates argued in notes to the examiners that they could not know how much time had been available to ask the client to provide further information. Such arguments did not get any credit. It is clear from the instructions that the facts given in the paper should be accepted. Hence, the script was expected to be based on the facts provided without any opportunity for additional information before the filing (a situation which often arises in practice).

When making claims appendant to preceding claims, not all candidates paid attention to correct references in the dependent claim. Thus, there were two different reactions carried out at different temperatures (oxyalkylation: 100 - 150°C, sulphonation: ≤135°C). Of course, inconsistencies between the dependent claim and the claim to which is was made appendant should be avoided, e.g. where a first claim refers to oxyalkylation and sulphonation, and the (multiply) dependent claim limits "the reaction temperature" to 30 to 80°C (which reaction?).

EXAMINATION COMMITTEE I

Candidate No. .....

Paper A (Chemistry) Schedule of marks

Category	Maximum possible	Marks awarded		Revision of marks / grade (if any)	
		Exr	Exr	Exr	Exr .....
Independent claims	28				
Dependent claims	12				
Description	8				
Total	48				
Corresponding Grade					

Translation of marks into grades

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

Marking by further examiners if appropriate

	Independent claims	Dependent claims	Description	Total	Grade
Examiner					
Examiner					

Remarks (which must be given if both the following requirements are fulfilled:
(a) the grades awarded by the two individual examiners before their discussion differ by two grades or more;
(b) the marks awarded by at least one of the two individual examiners have been changed during their discussion.)
If marks are revised, a brief explanation should be given.

Sub-Committee for Chemistry agrees on _____ marks and grade _____

Grade recommended to Board _____

Paris, 22 August 1997