

Candidate's Answer Paper
(Examination Paper B - Chemistry)

Dear Sirs

In response to the official communication of [], the applicant requests that further prosecution be based on the enclosed set of six claims filed in triplicate. Taking account of the documents cited in the above-mentioned communication and the arguments made by the Examining Division, the invention is now considered to lie in the chemical reactor according to claim 1, its use according to claims 2 to 5 and an aspect of its construction as defined at claim 6.

Art. 123(2)

It is submitted that the subject matter of the present claims finds basis in the application as filed at the referenced passages. Claim 1 is based on original claims 1 and 2 together with the description at page 95/B(C)/e/4, 3rd paragraph as well as at page 95/B(C)/e/6, penultimate paragraph. Claim 2 is supported by the passages mentioned for claim 1 and at original claim 8.

Claims 3-5 find basis in the original application at the passages already mentioned for claim 1 together with page 95/B(C)/e/4, 4th paragraph.

Novelty and Inventive Step

It is submitted that none of the cited documents anticipate the subject matter of the present claims, nor renders it obvious alone or in combination.

Document I mentions lead-antimony alloys but on casting, the alloys are simply "left to solidity". Accordingly, there is no mention of a homogeneous alloy as recited defined in present claim 1 and in any case there is no mention of the construction of chemical reactors.

Document II discloses lead-antimony alloys but again it gives disclosure of special steps to quench the molten alloy. Such a step is vital to prepare a homogeneous alloy as is witnessed by the disclosure in the present application as well as in Document III cited by the examiner.

Document II simply refers to the molten alloy simply being "allowed to cool". We submit, therefore, that homogeneous alloy as required in the present claims would not be formed.

Document III It is acknowledged that Document III teaches a considerable amount concerning metallurgical aspects of lead-antimony alloys which are homogeneous. It is noted that it also discloses that such alloys may be hardened to form plates by a rolling and finish rolling process. The resulting rolled cast bodies have good tensile strength properties and resistance to high pressures. However, the document provides no mention of chemical plant. Accordingly, the disclosure does not anticipate the novel subject matter of the present claims. Moreover, there is no mention of the technical problem of providing corrosion resistant joints between plates of the homogeneous alloys.

Document IV This document discloses the forming of urea in reactors wherein the reactor is made of rolled plate of homogeneous lead-antimony alloy. However, the joints provided between the plates are of pure lead. Thus, this document neither teaches the subject matter of the present

claims nor addresses the particular technical problem of avoiding the problem of contact corrosion in chemical reactors at the point of contact between alloy plates and joints.

Combination of III and IV

Document IV can be considered to be the closest state of the art with respect to the present claims because it deals with chemical reactors suited to a process for the preparation of a corrosive chemical, i.e. urea. The solution it suggests is the use of plates of rolled homogeneous lead-antimony alloy. It could be argued that the skilled worker would look to Document III to find out how to form an alloy plate suitable for use according to Document IV. However, neither of these documents suggests ways of dealing with the corrosion at the joints. In Document IV, it is mentioned that pure lead should be used. We would expect that such an arrangement would lead to the problems shown in the first part of example 2 of the present invention where some problems of corrosion were observed for Pb-Sb alloy plates where the plates contacted another material. (See page 95/B(C)/e/6, 5th paragraph, lines 1-4).

It is only in an arrangement according to the present invention that no corrosion is observed. See page 95/B(C)/e/6, penultimate paragraph of the present description. The advantage of the corrosion is found in the higher purity (i.e. absence of metallic impurities) of product streams of urea which require no purification before subsequent use, e.g. in the preparation of biuret for animal foodstuffs.

Further advantages are to be found at page 95/B(C)/e/4, 3rd paragraph. In particular the unhardened joints are more ductile and can undergo some expansion and contraction in a reactor subjected to variation of heat and pressure.

In the event of further objections, the applicant reserves the right to oral proceedings before issue of any negative decision. The description can be adapted when the allowability of the claims is indicated.

Encs. Claims 1-6.

1. A chemical reactor having an inner wall which comes into contact with the reaction mixture wherein the inner wall is constructed of plates made of a hardened alloy and joints are provided between the plates, the alloy of the plates and of the joints being of the same composition, which alloy is formed by forming a molten, homogeneous lead-antimony alloy containing 1-5% by weight based on the total weight of the alloy and quenching the alloy to a temperature of less than 200°C directly after casting and wherein the alloy of the plates is additionally subjected to rolling, after quenching, which rolling is conducted at 135 to 175°C with the thickness being reduced after each pass by 10 to 20%, after which it is finish rolled at 20 to 125°C, the total thickness being restricted by at least 10% and by 1 to 5% after each pass, thereby hardening the plate.
2. The use of a chemical reactor according to claim 1 for the processing of corrosive media.
3. The use of a chemical reactor according to claim 1 in the preparation of urea.
4. The use of a chemical reactor according to claim 1 in the preparation of urea with subsequent use of the urea in the preparation of biuret.

5. The use according to claim 4 wherein the biuret is used as an additive in animal feed.
6. A method of forming the joints between the plates in a reactor according to claim 1 wherein the joints are formed *in situ* with the plates allowing the heat to dissipate to allow the quenching.