

## Examiners' Report on Paper A/1998

An introductory remark must be made concerning the legibility of a number of scripts which were difficult or even virtually impossible to read.

The client's letter dealt with three related inventions:

1. the preparation of alloys (i.e. (a) the addition of vanadium oxycarbide (**VOC**) to molten steel; (b) the preparation of ferrovanadium based on **VOC**; (c) the preparation of alloys of vanadium (**V**) with aluminium (**Al**), nickel (**Ni**) and/or manganese (**Mn**));
2. the preparation of pure metals of Groups 4 and 5 (new IUPAC nomenclature, identical to the "old" transition groups IVB and VB as used in the client's letter) including **V** (i.e. the preparation these metals by heating the respective metal oxycarbides); at least 1600°C is required (also for **V** !);
3. the preparation of highly pure vanadium metal by preparing a **V/Mn** alloy (see invention 1) and volatilisation of the **Mn**.

All these inventions were based on oxycarbides and resulted in metals or metal alloys.

Some general facts common to these inventions could be derived from the client's letter: all inventions required the absence of oxygen and involved heating to high temperatures (to obtain a melt or to achieve certain minimum temperatures); heating of **VOC** resulted in **decomposition** to metallic **V** (page 2, invention 4 and page 3, penultimate paragraph) which could form an alloy with **Mn** (see invention 3) as an intermediate product for even purer **V**. In the two long paragraphs on page 4, reference was made to **decomposition** reactions at high temperatures, to the fact that thereby volatile or gaseous substances are set free, and to decomposition of oxycarbide to metals with liberation of carbon monoxide.

It could be concluded that heating of oxycarbides as used in these inventions meant their decomposition and that this fact was true for inventions 2 and 3 to the pure metals and for invention 1 wherein mixtures of different metals (alloys) were formed.

From the point of view of the products the inventions thus could be sorted into two groups: the preparation of alloys (invention 1) and to the preparation of pure metals (inventions 2 and 3). From the point of view of the process: Inventions 1 and 3 including one embodiment of invention 2 were based on vanadium oxycarbide. In invention 1, it was added to the other molten metals and thermally decomposed. In the one embodiment of invention 2, it was heated as such. In invention 2, metals were prepared by heating the respective metal oxycarbides.

Common to all the inventions was that each method started with an oxycarbide of a transition metal of groups 4 or 5. The oxycarbides were prepared by the same method which was, however, already known for **VOC**.

**Document I** described in general and amongst other irrelevant details the preparation of vanadium oxycarbide and it explained the nature of these non-stoichiometric compounds. So it should have been clear that there was no possibility to claim the vanadium oxycarbide *per se* or the process for its preparation or a process for making an oxycarbide of the elements of Groups 4 or 5 (which definition includes **V**). This should have become even clearer as the client stated that the process known from **Document I** was the basis for the preparation of the vanadium oxycarbide. The document refers to the use of a fluidised bed and to temperatures inside the same range. The absence of oxygen in such a process using gaseous hydrocarbons at these temperatures appears to be self-evident.

**Document II** demonstrated that carbides, oxycarbonitrides and oxycarbides of many transition metals additionally mentioned in the letter were already known. However, the document referred to a different manufacturing process (CVD, chemical vapour deposition starting with the metal *chlorides*).

It was admitted in the client's letter that all the oxycarbides were known and all the metals had already been available in varying purities. Therefore claims were expected to the processes. Having regard to the fact that no reference had been made in the letter to the alloys of aluminium, nickel and manganese with V, claims to alloys with these metals were accepted. On the other hand, claims to the pure metals or to Fe/V-alloys resulted in a significant loss of marks (note the Guidelines C-III, 4.7b and Decisions T150/82, T205/83, T990/96).

As regards the question of unity it could be argued that all the inventions were related in that they all involved the thermal decomposition of a metal oxycarbide and that none of the documents gave an indication that this step would have been known.

The easiest way to claim the inventions appeared to be to draft claims referring to the preparation of pure metals on the one hand and to the preparation of the alloys on the other hand.

Therefore a claim was expected to a process for the preparation of alloys of vanadium with iron or at least one metal of the group aluminium, nickel and manganese wherein vanadium oxycarbide as such or in admixture with the other metal(s) is thermally decomposed in the absence of oxygen. The oxycarbide could be added to the other metal in molten state or it could be mixed with the metal and before heating to melt (page 3, paragraph 4, page 4, paragraph 2).

A particular aspect of this embodiment to be claimed was the preparation of highly pure V by removal of manganese from a V/Mn alloy prepared according to the above process.

Another claim was expected to a process for the preparation of metals of Groups 4 and 5 by thermal decomposition of the oxycarbide at a minimum temperature of 1600 °C in the absence of oxygen (see invention 2).

Further features which could be made the subject-matter of dependent claims were: each melt being freed from slags, if any, and kept under inert gas, under a protective layer of slag or in vacuo at least until it has solidified when the alloy is allowed to cool down; the temperatures used; and the particulars of the preparation of the metal oxycarbide.

Apart from such process claims, use claims to the use of **VOC as such** in the preparation of alloys of vanadium with iron or at least one metal of the group aluminium, nickel and manganese and to the use of oxycarbides for the preparation of pure metals were deemed possible. It was also required to put down the necessary features.

The candidates should always bear in mind that certain numbers of marks are given to independent claims, to dependent claims and to the description. A too broad independent claim can therefore result in a loss of marks, simply for the reason that the independent claim is too speculative or even deficient (e.g. not novel), and that no further marks were available for dependent claims to be awarded to an appropriate claim appendant to the above broad claim.

A claim to V containing steel (an alloy of Fe) was deemed not novel (page 3, paragraph 3: "as usual"). There was no evidence at all that steel obtainable by the present process was

different from previously known steels prepared e.g. on the basis of ferrovanadium and vanadium nitride (see the Guidelines C-III, 4.7b). The absence of impurities (if carbon is considered as such an impurity) cannot render the subject-matter of such a claim novel (see T 205/83; OJ EPO 1985, 363). A claim to any of the metals *per se* (e.g. V) was directly contradictory to the last paragraph on page 2, and its subject-matter was therefore not novel. Consequently, such claims resulted in a significant loss of marks.

Some candidates gave the impression that they drew up numerous claims of the different categories automatically without considering whether there was a good chance of succeeding before the EPO (see Instructions to candidates for preparing their answers, 1998 version, page 26, point 5). Thus, in some scripts each method claim was followed by a product-by-process claim, despite clear indications in the Paper that the product claim could not be successful. This demonstrated that the candidate had not understood the criteria applied in the examination procedure before the EPO and gave rise to the question if (s)he was fit for practice. A representative must be aware of efficiency and costs to the benefit of the client.

A huge number of claims thus resulted in a lower number of marks than a short set of claims covering the essentials of the invention(s). Novelty is not the only criterion which must be met in accordance with Art. 52 (1) EPC by subject-matter for which the grant of European patents is requested.

A high number of candidates are still not aware that a new process need not yield a new product (Guidelines, C-III, 4.7b). In notes to the examiners they based their arguments for such claims on the fact alone that the metal was obtained in a new and inventive process. Such a claim resulted in a significant loss of marks, because it demonstrated that the concept of novelty and inventive step as established by the Boards of Appeal and as applied by the EPO was not understood.

A process claim can only properly be defined by process features, not by the desirable product (Guidelines C-III, 4.7). Such a claim did not gain marks.

Some candidates tried to combine as many of the aspects of the client's letter as possible in one claim. This ran the risk of introducing unclarity.

A number of candidates drew up a claim which included a limitation such as "in the preparation of Nb and Ti with plasma heating of up to 10000°C". This was not considered to be a helpful feature which could strengthen the protection sought or prevent a third party from carrying out the invention. If need be during further examination or opposition procedures, the disclosed value could be inserted into the claims for delimitation purposes anyway.

Some candidates deliberately refrained from drawing up claims to some of the inventions of the letter because they saw no technical support for such an invention, e.g. invention 3 was not claimed for this reason. There is no requirement for examples in the EPC. So this resulted in losses of marks which may have been substantial.

A number of candidates overlooked the essential heating step in their method or process claims. Other possibilities for preparing alloys might have been e.g. electrolysis or chemical reduction reactions, but there was no reference to any such method in the letter. According to the instructions to candidates for preparing their answers, 1998 version, page 25, point 3, the candidates are to accept the facts given in the paper and to limit themselves to these facts. Therefore a claim to "a process for obtaining a V/metal alloy

(metal = Fe, Al, Ni or Mn) comprising adding **VOC** to the metal in the absence of ... could not gain many marks (see also the Guidelines C-III, 4.4).

The same is true for a claim to a process for making steel by adding ferrovanadium obtained according to the invention. It is not evident that the ferrovanadium is novel and, hence, this is also true for the subject-matter of this claim (see page 1, paragraph 5).

A claim to the use of an additive for steel making comprising vanadium oxycarbide was suggested. It was given credit.

On the other hand, a remark in the description pointing out that a prior art document suggested the use of **VOC** as an additive in steel making was considered as not very helpful, if not positively detrimental for the client's application.

A statement that an embodiment was included in the description but not claimed in order to prevent a competitor from using this embodiment of the process not claimed was not understood and again considered adverse to the client's interests. Such a statement would indeed assist a competitor in avoiding the claims.

Statements of this kind resulted in loss of marks.

The documents were expected to be referred to shortly in the description. The problem(s) underlying the invention(s) was (were) also expected to be specified (Rule 27 (1) (b) and (c) EPC).