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TREATMENT OF MATERIALS CONTAINING TANTALUM AND NIOBIUM

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2 Claims. (Cl. 75—135)

This invention relates to an improved process for the recovery of tantalum and/or niobium from their ores, or from metallurgical by-products such as those in which the said elements may be found in the form of oxide compounds, free or combined.

This invention has for its object the recovery by an economical process of tantalum and/or niobium in the form of metals or of alloys.

According to the invention, the primary material is subjected to a selective reduction in the presence of one or several of the following reducing elements: Ca, Al, Si, Mg, alloyed or combined with one or more metals as characterized below, so as to obtain a product (alloy for instance) in which the ratio Nb:Ta is higher than that of the primary material.

The metals which are added to the reducing agents are such metals whose alloying or combination reaction with the aforesaid reducing agents develops heat so that the metallo-thermic power of a given quantity of these reducing elements is smaller in the obtained alloy or combination than in the same quantity in the elementary state. Among these metals, nickel, cobalt, iron, are more particularly contemplated.

For carrying this feature of the invention into effect, the primary material containing tantalum and niobium may be subjected inside a suitable metallurgical apparatus, such as an electric furnace, to a selective reduction in the presence of one or more of the elements Si, Ca, Al, Mg, the thermic capacity of which has been diminished by alloying or combining them to other metals such as Ni, Co, Fe. The amount of reducing agent may be so calculated that the major part of the Nb contained in the primary material is reduced and passes into an alloy in which the ratio Nb:Ta is higher than that of the primary material. The other component elements of the alloy are the metal or metals used for lowering the thermic capacity of the reducing agent.

By the process according to the present invention, an alloy is obtained in which the ratio Nb:Ta is higher than that of the primary material, and also a slag is obtained in which the ratio Nb:Ta is higher than that of the primary material. The slag may be treated by any suitable known process with a view to recovering the tantalum and niobium.

I claim:

1. A process for the treatment of primary materials containing tantalum and niobium, comprising a reduction of the primary material by means of at least one of the metals Al, Ca, Mg alloyed with at least one of metals whose alloying reaction with the aforesaid reducing elements develops heat so that the metallic-thermic power of a given quantity of the said reducing elements is smaller in the obtained alloy than in the same quantity in the elementary state, thereby selectively reducing the niobium relatively to the tantalum and obtaining an alloy in which the ratio niobium:tantalum is higher than in the primary material, and a slag in which the ratio tantalum:niobium is higher than in the primary material.

2. A process for the treatment of primary materials containing tantalum and niobium, comprising a reduction of the primary material by means of at least one of the metals Al, Ca, Mg alloyed with at least one of the metals Ni, Co, thereby selectively reducing the niobium relatively to the tantalum and obtaining an alloy in which the ratio niobium:tantalum is higher than in the primary material, and a slag in which the ratio tantalum:niobium is higher than in the primary material.

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