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## PROCESS FOR PRODUCING MOLYBDENUM ALLOYS

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The present invention relates to a novel and improved process of producing molybdenum containing alloy, and more particularly to the production of molybdenum containing ferrous alloys.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel compositions, steps, combinations and improvements herein shown and described.

It has heretofore been customary to introduce molybdenum into a ferrous alloy by the addition of ferro-molybdenum to the molten steel or other metal, or by the addition of calcium molybdate, or a similar salt of a molybdenum acid, to the molten metal or furnace charge, and this procedure has been followed for blast furnace practice as well as with electric furnaces and other melting processes. Lower calcium salts of molybdic acid have also been employed, and other salts of molybdic acid have been used successively, but for economical production calcium molybdate has been favored. All of these processes are characterized by the use of a less volatile form of molybdenum than the oxide and the usual process involves the preparation of molybdenum trioxide from molybdenite, and the conversion of the oxide into the salt by roasting or wetting the oxide and calcium oxide.

According to the present invention, the molybdenum trioxide is not converted into a molybdate before use, but is merely mechanically mixed with an oxide or oxide producing salt and this mechanical mixture is added to the blast furnace, electric furnace or other apparatus by which the ferrous metal is to be melted. Thereby is avoided the separate and distinct step of roasting or otherwise reacting the molybdenum oxide with the fixative calcium or other oxide and a corresponding economy is effected without any countervailing defect. By the process of the present invention, the recovery of the molybdenum is at least as great in the alloy as with calcium molybdate.

According to extended tests of the present invention, recovery of the molybdenum is nearly quantitative or 100 per cent.

The mechanical mixture of the molybdenum oxide and lime, or other volatilization-preventing oxide when added to the charge, first combines to form the corresponding molybdate which then reacts and dissolves in the molten metal. Preferably, the mixture comprises the stoichiometrical quantities of the substances although where an excess of slag is not objectionable, an excess of lime may be employed.

A substantially complete list of the various oxides and carbonates which may be employed in combination with the molybdenum oxide includes the alkaline earth oxides (magnesium, calcium, barium and strontium oxides), cupric oxide (CuO), beryllium oxide, lead oxide (PbO), ceric oxide (CeO<sub>2</sub>) and ferrous oxide (FeO) and the corresponding carbonates.

It is also possible to use certain natural minerals in place of the lime, etc.; and natural ferrous carbonate, siderite, spathic iron or chalybite may be used. Also certain silicides such as barium or calcium silicide may be used.

Having thus described this invention in connection with illustrative embodiments thereof, to the details of which I do not desire to be limited, what is claimed as new and what is desired to secure by Letters Patent is set forth in the appended claims.

What I claim is:—

1. A process of producing molybdenum containing ferrous alloys which includes adding to the metal to be alloyed a mechanical mixture of a molybdenum oxide and an oxide which prevents volatilization of the molybdenum oxide, and heating to reduce the molybdenum.

2. A process of producing molybdenum containing ferrous alloys which includes adding to the metal to be alloyed a mechanical mixture of a molybdenum oxide and a substance selected from the group consisting of magnesium, calcium, barium, strontium, cupric, beryllium, lead, ceric and ferrous oxides and carbonates, and heating to reduce the molybdenum and recover it in the metal.

3. A process of producing molybdenum containing ferrous alloys which includes adding to the metal to be alloyed a mechanical mixture of a molybdenum oxide and an alkaline earth oxide and recovering the molybdenum by heating the metal and mixture.

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