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TREATING FINELY DIVIDED MAGNESIUM

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5 Claims. (Cl. 75—67)

This invention relates to a method of consolidating finely divided metallic magnesium.

In the production of magnesium by thermal reduction processes, the magnesium vapors are frequently subjected to a so-called "shock-chilling" operation to quickly cool the vapors to a temperature below that at which the magnesium will react with substantial velocity with the associated carbon monoxide. This operation results in the formation of very finely divided particles of metallic magnesium, which may be coated with hydrocarbon oils and which frequently contain substantial amounts of carbon, magnesium oxide and other materials. The treatment of this finely divided magnesium presents many difficulties because of its pyrophoric properties, its relatively low heat conductivity and its high bulk volume.

It has been found that this material as well as finely divided magnesium material, in general, can be effectively consolidated by treating the finely divided magnesium with a metal having a lower melting point and a lower boiling point than magnesium. The treatment is preferably carried out at a temperature somewhat higher than the melting point of the treating metal. After the consolidation of the metallic magnesium particles by solution or alloying with the treating metal, the treating metal is removed from the residual magnesium, for example, by distillation.

Among the metals which may advantageously be used for the purposes of the invention are mercury, cadmium, zinc and sodium.

For example, finely divided metallic magnesium containing material obtained by the shock-chilling of magnesium vapors from the thermal reduction of magnesium oxide with carbonaceous material is added to approximately an equal volume of metallic mercury and the mixture is then subjected to agitation at about 100° C., for example, in a vapor tight rotating drum, until the metallic magnesium has substantially completely amalgamated with the mercury. The mercury is then separated from the magnesium by distillation. The consolidated magnesium may then be either cast directly or subjected to distillation or sublimation. If the finely divided magnesium contains substantial amounts of oil or other substances which tend to prevent contact of the mercury with the metallic particles, the consolidation may be accelerated by increasing the temperature of the treating, for example, by heating the mixture of mercury and finely divided magnesium to the boiling point of the mercury, preferably while refluxing any mercury vapors which are produced.

I claim:

1. A method of consolidating finely divided solid metallic magnesium which comprises treating the finely divided magnesium with a metal having a lower melting point and a lower boiling point than magnesium at a temperature above the melting point of the treating metal and thereafter separating the treating metal from the magnesium.

2. A method of consolidating finely divided solid metallic magnesium which comprises treating the finely divided magnesium with a metal selected from the group consisting of mercury, cadmium, zinc and sodium at a temperature above the melting point of the treating metal and thereafter separating the treating metal from the magnesium.

3. A method of consolidating finely divided solid metallic magnesium which comprises treating the finely divided magnesium with a metal having a lower melting point and a lower boiling point than magnesium at a temperature above the melting point of the treating metal and thereafter distilling the treating metal from the magnesium.

4. A method of consolidating finely divided solid metallic magnesium which comprises treating the finely divided magnesium with metallic mercury, and thereafter distilling the mercury from the magnesium.

5. A method of consolidating finely divided solid metallic magnesium which comprises treating the finely divided magnesium with metallic mercury at approximately the boiling point of mercury, and thereafter distilling the mercury from the magnesium.

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