

ABSTRACT OF THE DISCLOSURE

Process for making a crystalline solid-solution powder with low electrical resistance

A process for making a crystalline solid-solution powder which involves reacting at least two reactants in a plasma arc of a plasma chamber and blast-cooling the resultant product in a high velocity gas stream to form the powder. The first reactant is a molten metal alloy and the second reactant is a gas. The reaction is carried out in a plasma arc and the products rapidly cooled by a gas stream acting at the outlet opening of the plasma chamber. The crystalline solid-solution powder formed by the process has a low electrical resistivity. If an indium-tin alloy is used as the first reactant and oxygen as the second reactant, there is obtained an indium-tin-oxide (ITO) crystalline solid-solution powder which, when compacted to 40% of its theoretical density, has an electrical resistivity in the range of about $2 \Omega \text{ cm}$. This ITO crystalline solid-solution powder is particularly suitable for preparing an ITO target, with high electrical conductivity and thus high achievable sputtering rates.

(Fig. 2)