

Title (en)
METHOD FOR PRODUCING TRANSPARENT P-CONDUCTIVE CuAlO₂

Title (de)
VERFAHREN ZUR HERSTELLUNG VON TRANSPARENTEM P-LEITENDEN CuAlO₂

Title (fr)
PROCEDE DE PREPARATION DE CuAlO₂ TRANSPARENT CONDUCTEUR DE TYPE P

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Abstract (en)
[origin: WO2004106593A2] Transparent conductive materials are used for optoelectronic applications. However, the materials presently used are n-type semiconductors. Transparent p-type semiconductors are also required to produce pn transitions. Only a few such materials are known, but their long-term stability is questionable. Oxides would provide better stability for said application, but the structural conditions, under which they can be p-conductive are extremely restrictive. The synthesis of CuAlO₂ is complicated by the formation of binary oxides, spinell-type CuAl₂O₄ or metallic copper. At present, to produce pulverulent, pure CuAlO₂, binary oxides are reacted at temperatures of at least 1000 <°>C for at least 20 hours, with interruptions for renewed mixing and compression. The aim of the invention is to provide a method for producing transparent, p-conductive CuAlO₂, without producing undesirable companion products, in particular for optoelectronic applications, said method facilitating the cost-effective production of pulverulent CuAlO₂ with long-term stability. In said production method for transparent, p-conductive CuAlO₂, an exchange reaction consistent with the crystalline structure takes place. The alpha modifications of the non-conductive, ceramic-type material LiAlO₂ and CuCl then take part in a metathesis reaction by ion exchange, at a temperature in excess of approximately 330 °C, to form the desired crystalline structure of CuAlO₂ and LiCl that can be washed out. The inventive method is suitable for the production of transparent p-conductive CuAlO₂ for various optoelectronic applications, in particular large flat screens and thin-film solar cells.

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