

Production of Ag₂ZnO powders by hot mechanochemical processing

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Ag₂CdO composites are still one of the most commonly used electrical contact materials in low-voltage applications owing to their excellent electrical and mechanical properties. Nevertheless, considering the restriction on using Cd due to its toxicity, it is necessary to find alternative materials that can replace these composites. In this study, the synthesis of Ag₂ZnO alloys from Ag₂Zn solid solutions was investigated by hot mechanochemical processing. The hot mechanochemical processing was conducted in a modified attritor mill at 138 °C under flowing O₂ at 1200 cm³ /min for 3.0 h. The microstructure and phase evolution were investigated using X-ray diffractometry, field emission gun scanning electron microscopy and transmission electron microscopy. The results suggest that it is possible to complete the oxidation of Ag₂Zn solid solution by hot mechanochemical processing at a low temperature and short time. This novel synthesis route ca