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Preparation and properties of $\text{CuCr}_{1-x}\text{Fe}_x\text{O}_2$ thin films prepared by chemical solution deposition with two-step annealing

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ABSTRACT

Fe-doped copper chromium oxide ($\text{CuCr}_{1-x}\text{Fe}_x\text{O}_2$) thin films were prepared on non-alkali glass substrates by chemical solution deposition. The effects of the ambient gas and temperature annealing conditions were investigated in order to produce pure CuCrO_2 phase thin films at a relatively lower process temperature. A single-phase delafossite CuCrO_2 structure was obtained by two-step annealing method. The transmittance of the CuCrO_2 thin films was above 65% in the visible region, and the bandgap was estimated as 3.1 eV. The electrical and magnetic properties are also reported.

Keywords: p-type semiconductors, CuCrO_2 , Chemical solution deposition

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