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Title: Obtaining highly conductive oxide single crystals for manufacturing nanotemplates

Abstract
The present investigation is devoted to obtaining ZnO, In_2O_3 and Ga_2O_3 single crystals by chemical vapor transport (CVT). The thermodynamic analysis of the composition of CVT systems with ZnO, In_2O_3, Ga_2O_3 and various transport agents (TAs) is carried out for wide temperature range and for various density/composition of TA. The influence of the growth temperature and of the TA density/composition on the mass transport rate is investigated theoretically and experimentally. The possibility of increase in mass transport rate by several orders of magnitude at the presence of compound TAs is demonstrated.
The application prospects of obtained single crystals as substrates for manufacturing nanoporous matrices (nanotemplates) by the electrochemical etching are analyzed. The fabrication of nanopore arrays with various morphology, which depends on the crystallographic orientation of substrates, is demonstrated for ZnO.

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