

COLIBABA, G.V. Halide-carbon vapor transport of ZnO and its application perspectives for doping with multivalent metals. In: Journal of Physics and Chemistry of Solids. 2018, Vol.266, pp. 166 - 173. ISSN 0022-3697.

The growth of [ZnO single crystals](#) in closed ampoules using HCl+C mixture as a chemical vapor transport agent (TA) was studied. The influence of growth temperature, TA density, C/HCl ratio, and undercooling on the ZnO mass transport rate was investigated theoretically and experimentally. The influence of growth medium composition on the features of crystal growth, such as the minimization of growth nucleus density, the increase in the lateral growth rate of up to 1 mm per day, the suppression of the attachment effect, and stable growth of non-polar, semi-polar and polar planes of a [hexagonal](#) structure was analyzed. The structural, [photoluminescent](#), [optical and electrical properties](#) were investigated. The doping efficiency of ZnO by oxides of metals was analyzed for various TAs and Zn pressure in the growth medium. The possibility of increase in the doping efficiency by several orders of magnitude for multivalent metals was predicted for HCl+C TA.