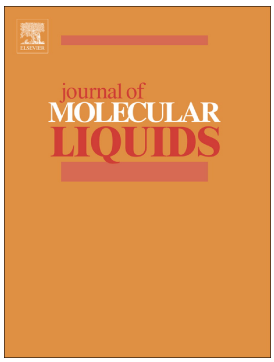

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Physicochemical properties of Al, Al-Mg and Al-Mg-Zn alloys

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Abstract

The effect of the addition of Mg and Zn to Al on its physicochemical properties was investigated. Using the discharge crucible method, three thermophysical properties (density, surface tension and viscosity) were determined for the Al, Al-Mg and Al-Mg-Zn alloys. The measurements were performed for Al and Al-Mg alloys in Krakow, in the temperature range from 723 to 1053 K, and for the Al-Mg-Zn alloys in Edmonton in the temperature range of 773 to 973K. The obtained viscosity values of pure Al show good agreement with the literature data. The viscosity data of Al-Mg alloys are lower those for pure metal Al and Mg. The addition of Zn to an Al-Mg alloy caused a slight increase in viscosity. For Al-Mg alloys, the surface tension results were compared with the Butler model, and the viscosity with several models.

Keywords: density, surface tension, viscosity, liquid, Al-Mg alloys, Al-Mg-Zn alloys