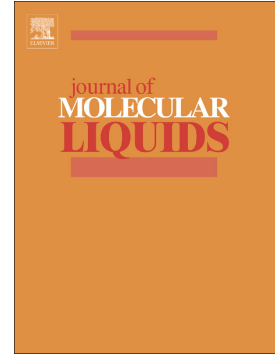


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Numerical investigation of vapor volume fraction in subcooled flow boiling of a nanofluid

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Abstract

The Mixture model is applied to study the subcooled boiling of Alumina-water nanofluid in both vertical concentric annulus and vertical tube. The turbulence of the fluid is modeled through k-epsilon model. Local flow characteristics of subcooled flow boiling such as axial volume fraction and distribution of temperature are predicted. There is a very good agreement among the numerical and experimental results in the literature. This model is able to predict the distribution of temperature and the axial vapor volume fraction precisely. Variations of vapor volume fraction in conditions of constant velocity and mass flux 'in inlet are investigated and compared with together in different nanoparticles concentrations.

Keywords:

Mixture model, subcooled flow boiling, vapor volume fraction, nanofluid, turbulence Model.

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