Improved refrigerant characteristics flow predictions in adiabatic capillary tube

Abstract

This study presents improved refrigerant characteristics flow predictions using homogenous flow model in adiabatic capillary tube, used in small vapor compression refrigeration system. The model is based on fundamental equations of mass, momentum and energy. In order to improve the flow predictions, the inception of vaporization in the capillary tube is determined by evaluating initial vapor quality using enthalpy equation of refrigerant at saturation point and the inlet entrance effect of the capillary tube is also accounted for. Comparing this model with experimental data from open literature showed a reasonable agreement. Further comparison of this new model with earlier model of Bansal showed that the present model could be use to improve the performance predictions of refrigerant flow in adiabatic capillary tube.