

Diabatic Flow of Sub-Cooled R-600a Inside a Capillary Tube: Concentric Configuration

Authors : Ravi Kumar, Santhosh Kumar Dubba

Abstract : This paper presents an experimental study of a diabatic flow of R-600a through a concentric configured capillary tube suction line heat exchanger. The details of experimental facility for testing the diabatic capillary tube with different inlet sub-cooling degree and pressure are discussed. The effect of coil diameter, capillary length, capillary tube diameter, sub-cooling degree and inlet pressure on mass flow rate are presented. The degree of sub-cooling at the inlet of capillary tube is varied from 3-20°C. The refrigerant mass flow rate is scattered up with rising of pressure. A semi-empirical correlation to predict the mass flow rate of R-600a flowing through a diabatic capillary tube is proposed for sub-cooled inlet conditions. The proposed correlation predicts measured data with an error band of ± 20 percent.

Keywords : diabatic, capillary tube, concentric, R-600a

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