Pool Boiling Heat Transfer of R116 at Various Pressures

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As one component of the binary refrigerant mixture of R508 for two-stage cascade refrigeration systems, hexafluoroethane (R116) has been used for several decades. However, few pool boiling heat transfer data for R116 are available in the open literature. Therefore, extensive studies on R116 pool boiling heat transfer were made in this work at various pressures from 0.1 MPa to 0.9 MPa. Heat transfer coefficients of the nucleate pool boiling on a flat smooth copper surface were carefully measured. The uncertainties of the experiments were analyzed in detail. Most efforts were made to know the pressure influence on nucleate pool boiling heat transfer behaviors of R116. From the results of the experiments, when the pressure is lower than 0.3 MPa, the pool boiling heat transfer coefficients increase with pressure, reaching a maximum at a pressure of 0.3 MPa; however, they decrease with pressure when the pressure is higher than 0.3 MPa. Furthermore, some discussions were made based on the results of experiments.