中国化学工程学报 2001 9 (1): 17-21 ISSN: 1004-616x CN: 44-1063/R

RESEARCH PAPERS

聚合物涂层竖板上水蒸气滴状冷凝传热特性的研究

马学虎, 陈嘉宾, 徐敦颀, 林纪方

Institute of Chemical Engineering, Dalian University of Technology, Dalian 116012, China

收稿日期 修回日期 网络版发布日期 接受日期

摘要 The plasma polymerization method and dynamic ion-beam mixed implantation method were
employed to coat ultra-thin polymer films on copper plates. Experiments indicated that steady dropwise condensation of steam at atmospheric pressure occurred. The condensation heat transfer coefficients increased by approximately 3 and 5－7 times for the polytrimethylvinylsilane film and polytetrafluoroethylene film respectively, compared with the value for film condensation under the same experimental conditions. The temperatures on

the condensing surface and inside the test block were found to be rapidly and randomly fluctuated. The properties of the coated films and advantages of the methods used in this investigation were discussed briefly.

关键词 dropwise condensation heat transfer polymer film temperature fluctuation

分类号

DOI:

Heat Transfer Characteristics of Dropwise Condensation of Steam on Vertical Polymer Coated Plates

MA Xuehu, CHEN Jiabin, XU Dunqi, LIN Jifang

Institute of Chemical Engineering, Dalian University of Technology, Dalian 116012, China

Received Revised Online Accepted

Abstract The plasma polymerization method and dynamic ion-beam mixed implantation method were employed to coat ultra-thin polymer films on copper plates. Experiments indicated that steady dropwise condensation of steam at atmospheric pressure occurred. The condensation heat transfer coefficients increased by approximately 3 and 5－7 times for the polytrimethylvinylsilane film and polytetrafluoroethylene film respectively, compared with the value for film condensation under the same experimental conditions. The temperatures on the condensing surface and inside the test block were found to be rapidly and randomly fluctuated. The properties of the coated films and advantages of the methods used in this investigation were discussed briefly.

Key words dropwise condensation heat transfer; polymer film; temperature fluctuation

通讯作者:
马学虎
作者个人主页: 马学虎; 陈嘉宾; 徐敦颀; 林纪方