

反应堆工程

水平窄缝内多孔介质传热特性研究

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摘要 对面朝下加热水平窄缝内多孔介质的传热特性进行了实验研究, 得到了不同工况下的沸腾曲线。通过比较各工况下的沸腾曲线得出: 多孔介质的存在大幅提高了面朝下加热水平窄缝内传热的换热系数, 尤其是沸腾段的换热得到了很大程度的强化; 提高窄缝宽度, 选用热导率高的固体微粒制作多孔介质等可提高多孔介质的换热能力。根据多孔介质传热的机理, 拟合出了面朝下加热水平窄缝内多孔介质的自然对流传热与核态沸腾传热关联式。

关键词 [面朝下加热](#); [水平窄缝](#); [多孔介质](#); [自然对流](#); [核态沸腾](#)

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Characteristics of Heat Transfer for Narrow Gap on Horizontal Heated Surface With Porous Media

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Abstract Experiments were carried out to study the characteristics of heat transfer on a downward-facing heated surface with porous media in narrow horizontal gap at atmosphere pressure using water as working fluid. The boiling curves were obtained under different conditions. The heat transfer increases significantly with porous media in the gap especially under boiling condition. The heat transfer in narrow horizontal gap can be enhanced by increasing the gap size and by using porous media with high thermal conductivity and appropriate porosity. Based on the mechanism of heat transfer in porous media, the correlations for natural convection and nucleate boiling were proposed to predict the heat transfer under the present condition.

Key words [downward-facing](#) [heated surface](#) [narrow horizontal gap](#) [porous media](#) [natural convection](#) [nucleate boiling](#)

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