多相流

# 两流体颗粒间最小液膜厚度的靠近-减薄耦合模型

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摘要　　运用平面膜概念将两流体颗粒靠近接触过程与所挟持液膜的排液减薄过程结合起来，建立了两流体颗粒接触挟持液膜最小厚度模型，并讨论了粒径比、初始相对速度、界面张力和连续相黏度等因素对最小膜厚度的影响. 通过模型计算结果与文献报道结果的比较说明了该模型的合理性.
关键词　　流体颗粒　液膜　最小厚度　数学模型

分类号

# MODEL OF MINIMUM THICKNESS OF LIQUID FILM BETWEEN TWO FLUID PARTICLES BY COUPLING OF APPROACHING AND THINNING

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**Abstract**

Coalescence process of two fluid particles is very complicated. This paper tries to integrate the approaching process of two fluid particles and the draining process of the intervening liquid film between two particles, by using the assumption of plane film and taking into consideration the change of the radius of plane film and the interaction force between two fluid particles with time. Thus, an integrated model for the minimum thickness of the intervening liquid film between two contacting fluid particles is developed.The effects of size ratio, initial relative velocity, interface tension and viscosity of continuous phase on minimum film thickness are discussed based on the integrated model. The comparison between the model calculation and the data from Scheele and Leng shows that this model is reasonable.The Stefan-Reynolds equation is only fit for draining of plane film which has been formed already, so its time coordinate is not identical to that of the contact interaction plane film model.Accordingly a time difference should be allowed for in advance in this model.

**Key words**　fluid particles　liquid film　the minimum thickness　mathematical model

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