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多相流和计算流体力学

颗粒与分布板的碰撞声信号分析及其流化状态的识别

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摘要

关键词

声信号 气固流化床 起始流化速度 起始湍动速度 方差

分类号

扩展功能
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· 阳永荣
· 蒋斌波

Determination of flow regime by analysis of acoustic signals from impaction between particles and distributor

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Abstract

Acoustic signals emitted from particles and bubbles in the gas-solid fluidized bed were collected by the transducer located under the distributor and the result showed that the energy and deviation of acoustic signals varied regularly with superficial velocity.Superficial velocity was the minimum fluidizing velocity or the minimum turbulent velocity, while energy or deviation changed suddenly.Then a criterion to determine the change of flow pattern was obtained that when the ratio of acoustic energy or deviation reached the maximum, the velocity was the minimum fluidizing velocity, while the ratio of acoustic energy or deviation reached the next maximum the corresponding velocity was the minimum turbulent velocity.Experiments were carried out in a fluidized bed with inner diameter of 250 mm and polyethylene resin particles.The minimum fluidizing and minimum turbulent velocity obtained from the new method agreed well with those deducted from classical equations and traditional methods, including pressure difference method and pressure fluctuation method.In conclusion, an easy, sensitive, exact and on-line way to detect fluidizing velocity is presented, and this method is applicable to industrial equipment.

Key words

acoustic emission signals gas-solid fluidized bed minimum fluidizing velocity minimum turbulent velocity deviation

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