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多相流

磁流化床磁稳流化区域的确定及影响因素

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摘要 通过对磁流化床中四种铁磁颗粒（其平均粒径dp范围为231～512mm）流化特性的实验研究，得出磁流化床的磁稳流化区域与磁场强度、颗粒粒径之间的变化关系。在此基础上，运用量纲分析法，得到磁稳流化区域与磁重势能比Er、阿基米德数Ar、雷诺数Re等无量纲数之间的关系，并回归得出确定磁稳流化区域的实验关联式。同时，对实验关联式进行了显著性检验，结果表明，Er对磁稳区域的大小影响最为显著，Ar次之，Re则最不显著。

关键词 磁流化床 磁稳流化区域 实验关联式 显著性检验

分类号

Determination of stable zone and related factors in magnetically fluidized bed

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Abstract

Experimental research on the fluidized characteristics of four magnetic particles with different average diameters (from 213 μm to 512 μm) was carried out in this study.The effects of such factors as intensity of the magnetic field and diameter of the particles, on the stable zone in the magnetically fluidized bed were investigated and discussed.Based on the experiments,by using the dimensionless analysis method, an experimental correlation to calculate the stable zone with three dimensionless numbers, i.e. the ratio of magnetic potential to gravity potential Er, Archimedes number Ar and Reynolds number Re, was proposed.In addition, the level of significance of the correlation was tested, and the results showed that the most significant factor to influence the stable fluidization zone was Er, and Ar was the second, while Re was the least significant factor.

Key words magnetically fluidized bed stable fluidization zone experimental correlation significance test

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