化学

气体离心机二维供料射流的数值研究

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摘要　　为研究供料射流对气体离心机内部环流的影响，采用计算流体力学(CFD)方法模拟气体离心机二维轴对称供料射流流场，利用得到的流场数据对离心机环流的供料边界条件进行修正，得到了在考虑供料射流影响下，离心机环流的流场分布。在射流流场的数值模拟中，采用有限体积法离散旋转圆柱坐标系下的Navier-Stokes（N-S）方程组，使用隐式二阶迎风格式迭代求解。利用有限差分法求解二维轴对称线性化的无量纲离心机流体动力学方程组，求解得到了供料射流修正后的离心机环流流场分布。计算结果表明：供料射流对离心机环流有较大影响，利用供料射流流场的结果对环流计算进行修正是可行的，可以模拟更接近实际的离心机的内部环流。

关键词　气体离心机　供料射流　数值模拟　环流

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2D Numerical Study of Feed-Jet Flow in Gas Centrifuge

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Abstract Computational Fluid Dynamics (CFD) method was adopted to simulate the 2D symmetrical feed-jet flow-field in Iguacu gas centrifuge, in order to study the influence of feed-jet to counter-current. The data acquired from calculation were used to modify the feed boundary condition in counter-current calculation, and the stream lines distribution was got considering the effect of the feed-jet. Finite volume method and 2-order implicit scheme were adopted to solve Navier-Stokes (N-S) equations in cylinder coordinates to simulate the feed-jet flow. Finite difference method was used to solve centrifuge fluid dynamics equations. The results indicate that the feed-jet flow affects the counter-current observably, the results of feed-jet flow simulation can be used to modify the conditions to calculate the counter-current in the real centrifuge.

Key words gas centrifuge feed-jet flow numerical simulation counter-current

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