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Numerical Simulation of Flow and Particle Motion in Liquid – Solid Hydrocyclone

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Abstract : In this investigation a hydrocyclone by using for separation particles from fluid in oil and gas, mining and other industries is simulated. Case study is cone – cylindrical and solid - liquid hydrocyclone. The fluid is water and the solid is a type of silis having diameters of 53, 75, 106, 150, 212, 250, and 300 micron. In this investigation CFD method used for analysis flow and movement of particles in hydrocyclone. In this modeling flow is three-dimention, turbulence and RSM model have been used for solving. Particles are three dimensional, spherical and non rotating and for tracking them Lagrangian model is used. The results of this study in addition to analyzing flowfield, obtaining efficiency of hydrocyclone in 5, 7, 12, and 15 percent concentrations and compare them with experimental result that both of them had suitable agreement with each other.

Keywords : hydrocyclone, RSM Model, CFD, copper industry
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