Evaluation of the Effect of Pitched Blade Impellers on the Performance of an Electrochemical Reactor

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The use of electrochemical reactors to remove hexavalent chromium (Cr(VI)) in aqueous media, has shown remarkable results and it can be considered as a potential clean technology. In order to increase the reactor performance, its hydrodynamics must be studied. In this work, an electrochemical reactor with rotating rings electrodes and inner impellers added to the drive shaft has been proposed. Its performance was evaluated by CFD simulations, for different arrays of impellers at different rotational speeds. Although power consumption increased for higher speeds, vorticity and turbulence intensity were also increased inside the rotating rings electrode, thus improving the hydrodynamic performance of the reactor..

Keywords: Electrochemical reactors, Computational Fluid Dynamics, pitched blade impellers, hexavalent chromium

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