CHARACTERIZATION OF AN ELECTROCHEMICAL REACTOR BY HYDRODYNAMIC AND MASS TRANSPORT STUDIES

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This work deals with the study of a filter-press type electrolyser (a home-made UA63.03) with undivided configuration. It analyses the influence of the presence of turbulence promotors in hydrodynamic and mass transport behaviours.

A simple experimental arrangement was used to generate data from electrolytic conductivity measurements in a series of impulse-response experiments. The flow distribution inside the reactor compartments is influenced by the presence and type of turbulence promotors and a new model was developed to analyze the different residence time distributions (RTD). The turbulence factor, $\Theta_{\beta}N_{\alpha}$, was proposed to classify the turbulence promotors.

Using the same reactor, mass transport coefficients were determined by the limiting current technique, by means of the cathodic reduction of Cu(II) in Na_2SO_4 0.5 M at pH 2. An enhancement factor was used to classify the turbulence promotors.

Similar conclusions were obtained using both methods, indicating that the RTD simulation method developed is appropriate and useful for predicting/simulating hydrodynamic behavior.

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