

Zeolite coated ceramic tubular membrane for Co(II) to Co(III) oxidation in sulfuric acid medium

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Zeolite coated ceramic membranes have been used for gas and liquid separations due to their high separation performance, good catalytic activity, high thermal, chemical and mechanical stability as well as chemical and solvent resistance. These are promising candidates as membrane separators as they possess the nanoporous structure required to remove ions from aqueous electrolyte solutions. Therefore, they may be used as an alternative to Nafion proton conducting polymeric membranes in the divided electrolytic cells. In the present study we have investigated the performance of tubular type zeolite coated alumina membrane placed inside the custom made tubular electrolytic cell. Cobalt(II) in sulfuric acid was taken as the model metal ion precursor for the oxidation. It was observed that the current density of the electrodes, concentration of the metal ion, concentration of the acid electrolyte and temperature were the influential parameters.