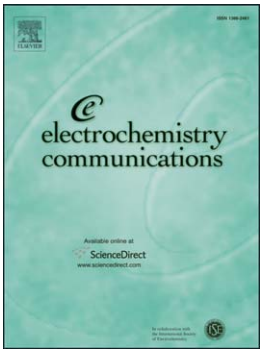

Electrochemical synthesis at pre-pilot scale of 1-phenylethanol by cathodic reduction of acetophenone using a solid polymer electrolyte

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Electrochemical synthesis at pre-pilot scale of 1-phenylethanol by cathodic reduction of acetophenone using a solid polymer electrolyte.

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Abstract

The pre-pilot scale synthesis of 1-phenylethanol was carried out by the cathodic hydrogenation of acetophenone in a 100 cm^2 (geometric area) Polymer Electrolyte Membrane Electrochemical Reactor. The cathode was a Pd/C electrode. Hydrogen oxidation on a gas diffusion electrode was chosen as anodic reaction in order to take advantage of the hydrogen evolved during the reduction. This hydrogen oxidation provides the protons needed for the synthesis. The synthesis performed with only a solid polymer electrolyte, spe, has lower fractional conversion although a higher selectivity than that carried out using a support-electrolyte-solvent together with a spe. However, the difference between these two cases is rather small and since the work-up and purification of the final product are much easier when only a spe is used, this last process was chosen for the pre-pilot electrochemical synthesis of 1-phenylethanol.

Keywords: 1-phenylethanol, PEMER, solid polymer electrolyte, electrochemical hydrogenation, acetophenone.

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