

The Catalytic Partial Oxidation of p-Xylene in Supercritical Water

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Terephthalic acid is mainly made from partial oxidation of p-xylene and used as an important polymer intermediate in many industries. However, In spite of its wide use, it is known that acetic acid as a solvent in the conventional process causes the corrosion problem to the process. To avoid corrosion from acetic acid, we used supercritical water as an alternative solvent.

In this experiment, we investigated the feasibility of terephthalic acid synthesis via catalytic partial oxidation of p-xylene in supercritical water. We studied the effect of some key process variables such as reaction time and catalyst type. In this work, p-xylene was partially oxidized in supercritical water condition(400 °C, 280 bar) with batch type reactor. The reactor volume is 23.8 ml, and hydrogen peroxide is used as an oxidizer. Products such as terephthalic acid, p-tolualdehyde, p-toluic acid, 4-CBA, terephthalaldehyde, and benzoic acid were analyzed by high performance liquid chromatography(HPLC).