

## Uncatalyzed Partial Oxidation of p-Xylene to Terephthalic Acid in Sub-critical Water

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Terephthalic acid(TPA) has become an important, fast-growing chemical as a raw material for polyethylene terephthalate(PET). Nowadays, most of TPA used worldwide is produced by the catalytic oxidation of p-xylene. This process, however, has some disadvantages. The oxidation requires acetic acid as a solvent and is catalyzed by mixture of heavy metals such as manganese, cobalt and bromine salts. Recently, sub- or supercritical water process was developed to overcome these disadvantages for the production of TPA. In this study, partial oxidation of p-xylene to TPA was performed without a catalyst in sub- or near-critical water. Hydrogen peroxide was used as oxidant for partial oxidation of p-xylene. The loaded amount of hydrogen peroxide was the most important parameter to control the proceeding limit of partial oxidation of p-xylene, while the temperature and pressure, determining the thermodynamic state of water, was the most important parameter for determining the reaction pathway and the reaction rate.