中国化学工程学报 2001 9 (2): 137-140 ISSN: 1004-616x CN: 44-1063/R

RESEARCH PAPERS

难降解芳烃化合物在超临界水中氧化的COD去除率的研究

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收稿日期 修回日期 网络版发布日期 接受日期

摘要 Some aromatic compounds, phenol, aniline and nitrobenzene, were oxidized in supercritical
water. It was experimentally found that the chemical oxygen demand (COD) removal efficiency
of these organic compounds can achieve a high level more than 90% in a short residence time
at temperatures high enough. As temperature, pressure and residence time increase, the COD
removal efficiencies of the organic compounds would all increase. It is also found that
temperature and residence time offer greater influences on the oxidation process than
pressure. The difficulty in oxidizing these three compounds is in the order of nitrobenzene
＞ aniline ＞ Phenol. In addition, it is extremely difficult to oxidize aniline and
nitrobenzene to CO2 and H2O at the temperature lower than 873.15 K and 923.15 K,
respectively. Only at the temperature higher than 873.15 K and 923.15 K, respectively, the
COD removal efficiencies of 90% of aniline and nitrobenzene can be achieved.

关键词 phenol aniline nitrobenzene supercritical water oxidation chemical oxygen demand
分类号
DOI:

COD Removal Efficiencies of Some Aromatic Compounds in Supercritical Water Oxidation

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Received Revised Online Accepted

Abstract Some aromatic compounds, phenol, aniline and nitrobenzene, were oxidized in supercritical water. It was experimentally found that the chemical oxygen demand (COD) removal efficiency of these organic compounds can achieve a high level more than 90% in a short residence time at temperatures high enough. As temperature, pressure and residence time increase, the COD removal efficiencies of the organic compounds would all increase. It is also found that temperature and residence time offer greater influences on the oxidation process than pressure. The difficulty in oxidizing these three compounds is in the order of nitrobenzene ＞ aniline ＞ Phenol. In addition, it is extremely difficult to oxidize aniline and nitrobenzene to CO2 and H2O at the temperature lower than 873.15 K and 923.15 K, respectively. Only at the temperature higher than 873.15 K and 923.15 K, respectively, the COD removal efficiencies of 90% of aniline and nitrobenzene can be achieved.

Key words phenol; aniline; nitrobenzene; supercritical water oxidation; chemical oxygen demand

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