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Degradation of textile dyes in aqueous solutions using type-Fenton bimetallic zeolite catalysts

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Textile dyes are growing to be a problematic class of pollutants to the environment. The disposal of dyes in water resources has bad aesthetic and health effects, since most of them are carcinogenic and mutagenic [1,2], so it is important to remove them from the environment. Effective and economic treatment by advanced oxidation processes (AOPs) has been attracted great and continuous interest for the degradation of these pollutants [3]. The heterogeneous Fenton-like processes have been paid great attention for its low cost, high efficient and mild conditions among these AOPs processes (20-50°C and atmospheric pressure) [3,4]. Recently, several iron- and copper- based heterogeneous Fenton catalysts have been investigated to be efficient catalytic systems [4]. In this work, in the preparation of type Fenton catalysts, zeolite NaY was used to support Fe, Cu and Mn. The type-Fenton catalysts, mono and bimetallic, were prepared by ion exchange method and the catalysts were tested in degradation of textile dyes in a batch reactor using H₂O₂ at different temperatures and atmospheric pressure. It was observed that iron type-Fenton catalysts are active for the degradation of dyes, but when the reaction is performed with bimetallic type-Fenton zeolite catalysts the degradation becomes faster.

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