

磁性LDH负铜催化剂的制备及其对直接青莲D-BL的脱色

Synthesis and evaluation of copper-loaded magnetic LDH catalysts used in decoloration of dyestuff D-BL

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| 作者 | 单位 |
|---------------------|--|
| 刘琰 | 1. 陕西师范大学环境科学系, 西安 710062; 2. 山东海美依项目咨询有限公司, 济南 250100 |
| 李剑超 | 1. 陕西师范大学环境科学系, 西安 710062 |
| 张红 | 1. 陕西师范大学环境科学系, 西安 710062 |
| 刘啸乾 | 1. 陕西师范大学环境科学系, 西安 710062 |
| 杨晓青 | 2. 山东海美依项目咨询有限公司, 济南 250100 |
| 毛勇 | 1. 陕西师范大学环境科学系, 西安 710062 |

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中文摘要:

实验以滴定共沉淀法制备Mg-Al LDH晶体包覆的 Fe_3O_4 颗粒,利用LDH的层间阴离子交换性使其吸附 $[Cu(C_2O_4)_2]^-$ 络合离子,通过焙烧获得磁性焙烧态LDH载体的负铜催化剂。并通过SEM、X-Ray、FT-IR等方法以及静态实验,表征及考察了材料的物化特性及其直接性偶氮染料直接青莲的脱色性能。结果表明,材料对该染料废水有较强去除能力,且磁性良好易于分离回收;其最佳制备条件为用浓度为20 g/L的 $K_2[Cu(C_2O_4)_2]$ 溶液改性一次,反应结束后于450℃下焙烧5 h;上述条件下制备的材料投加量为1 g/L、 H_2O_2 浓度为6.53 g/L、处理时间2 h,对200、300和500 mg/L浓度的模拟直接青莲D-BL染料废水去除率分别为99.62%、90.43%和81.92%。

英文摘要:

The magnetic particles of Fe_3O_4 were coated by Mg-Al layered double hydroxides via co-precipitation firstly. With anion exchange reactions, the coordination compound $[Cu(C_2O_4)_2]^-$ was intercalated into the layers of the magnetic LDHs, and the prepared solids were calcined to obtain inorganic CCML catalysis (copper-loaded magnetic LDH catalysts). The catalysts were characterized via SEM, X-Ray, FT-IR. And the catalysis performance of them was evaluated with a set of static experiments. Optimum conditions of preparation were that the magnetic LDHs were modified by $[Cu(C_2O_4)_2]^-$ solution for one time, the temperature and time of calcination were 450℃ and 5 h, respectively. In the static CWPO experiments of decoloration of direct violet D-BL, CCML catalysts can obtain removal rates of 99.62%, 90.43% and 81.92% with original dye concentrations of 200, 300 and 500 mg/L, respectively.

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