

论文

新型深海中温菌 *Wangia profunda*(SM A87)胞外多糖对对硝基苯胺的吸附研究

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摘要:

采用深海中温菌 *Wangia profunda* (SM A87)的胞外多糖对对硝基苯胺进行吸附试验。分别用热分析仪、FTIR和Zeta电位仪对胞外多糖进行表征分析,并研究了吸附时间、胞外多糖用量、pH和温度等方面对其吸附规律的影响。结果表明:胞外多糖可有效去除水中的对硝基苯胺。20℃时,0.1g/L的SM A87胞外多糖吸附处理50mL初始浓度为15mg/L的对硝基苯胺水样120min后,对硝基苯胺的最大吸附率可达91%;Langmuir、Freundlich、Redlich-Peterson等温方程和准二级动力学方程均能较好地描述SM A87胞外多糖吸附对硝基苯胺的热力学及动力学过程,由Langmuir方程得到SM A87胞外多糖对对硝基苯胺的最大吸附量为769.2mg/g(30℃)。

关键词: 深海中温菌SM A87;胞外多糖;对硝基苯胺;生物吸附

*p*-nitroaniline biosorption by a novel exopolysaccharide from the deep sea mesophilic bacterium *Wangia profunda* (SM A87)

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Abstract:

Biosorption of *p*-nitroaniline by exopolysaccharide (EPS) from the deep sea mesophilic bacterium *Wangia profunda* (SM A87) was studied. The SM A87 EPS were respectively characterized by DSC / TGA, FTIR and Zeta potential. The influence of contact time, SM A87 EPS dosage, pH and temperature were investigated by batch adsorption experiments. The results showed that SM A87 EPS was particularly effective at removal *p*-nitroaniline from aqueous solution. The adsorption ratio of *p*-nitroaniline could reach 91%, under the condition of 20℃, *p*-nitroaniline concentration of 15mg/L, EPS dosage of 0.1g/L and equilibrium time at 120min. The equilibrium data at different temperatures fitted all the Langmuir, Freundlich and Redlich-Peterson models well. The maximum adsorption capacity of *p*-nitroaniline was calculated to be 769.2mg/g (30℃) according to the Langmuir model. Compared with the pseudo first order kinetic model, the biosorption kinetics for *p*-nitroaniline can be well described by the pseudo second order kinetic model.

Keywords: *Wangia profunda* SM A87; exopolysaccharide; *p*-nitroaniline; biosorption

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