

SEPARATION SCIENCE & ENGINEERING

趋磁细菌对Au(III)和Cu(II)的吸附平衡及动力学研究

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摘要 Magnetotactic bacteria (MTB) as biosorbents for the adsorption of Au(III) and Cu(II) ions from aqueous solution have been investigated. The optimum adsorption conditions for both metal ions were the initial pH scope of 1—5.5 for Au(III) and 2.0—4.5 for Cu(II), room temperature, biomass concentration of 10.0g/L-1 and sorption duration more than 10 min. When the initial metal concentration were within 500mg/L-1, the maximum biosorption capacity of 1.0g of MTB (dry mass basis) for Au(III) and Cu(II) were calculated as 505.2mg of Au(III) and 493.1mg of Cu(II) by Langmuir model in single system, respectively. The isotherm equilibrium of Au(III) and Cu(II) ions in the Au-Cu binary system reflected a unique phenomenon that the adsorption of Au(III) was reinforced and that of Cu(II) prohibited, compared respectively with their performances in the single metal system. When the concentration of Au(III) and Cu(II) were below 80mg/L-1, the wastewater after MTB treating was below 1.0mg/L-1, which is in conformity with Environmental Performance Standards (EPS) of Canada. Besides, all the kinetic data were fitted well to the pseudo second-order kinetic model with a high correlation coefficient ($R^2 > 0.999$).

关键词 [magnetotactic bacteria](#) [selective adsorption](#) [adsorption equilibrium](#) [adsorption kinetics](#) [Au\(III\)](#)

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Key words [magnetotactic bacteria](#); [selective adsorption](#); [adsorption equilibrium](#); [adsorption kinetics](#); [Au\(III\)](#)

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