

研究论文

## PEI/SiO<sub>2</sub>复合型吸附材料对尿酸吸附特性的研究

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**摘要** 通过 $\gamma$ -氯丙基三甲氧基硅烷的偶联, 将聚乙烯亚胺(PEI)偶合接枝在硅胶微粒表面, 制得了对尿酸有强吸附性能的复合型医用吸附材料PEI/SiO<sub>2</sub>. 静态吸附实验结果表明, 凭借强烈的氢键相互作用, 硅胶表面的聚胺大分子PEI对尿酸的互变异构体三羟基嘌呤具有很强的吸附能力, 等温吸附满足Freundlich吸附方程, 饱和吸附量可达84.9 mg/g; 介质的pH值对吸附作用有很大的影响, 在中性溶液中(pH=6~7), 复合吸附材料PEI/SiO<sub>2</sub>对尿酸具有强吸附能力, 而在酸性与碱性溶液中吸附能力都较弱; 温度对吸附性能也有影响, 升高温度吸附量增大.

**关键词** [尿酸](#) [医用吸附材料](#) [聚乙烯亚胺](#) [氢键相互作用](#)

分类号

## Studies on Adsorption Character of Novel Composite Material of Polyethylenimine/SiO<sub>2</sub> for Uric Acid

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**Abstract** Polyethylenimine (PEI) was grafted on silica particles by using  $\gamma$ -chloropropyltrimethoxysilane as couplant, and the novel composite adsorption material of PEI/SiO<sub>2</sub> for medical application was prepared, which has strong adsorption ability toward uric acid. Static adsorption experiment results show that the macromolecules of PEI on silica particles can produce strong adsorption force for trihydroxyl purine that is a tautomer of uric acid by hydrogen bond interaction. The isothermal adsorption was accorded with Freundlich equation, and the saturated adsorption amount was able to reach 84.9 mg/g. The pH value of the aqueous solution might exert great effect on adsorption property of PEI/SiO<sub>2</sub>. In neutral solution PEI/SiO<sub>2</sub> had very strong adsorption ability. In acidic or basic solution the adsorption actions were all weak. Temperature had a certain influence on adsorption property of PEI/SiO<sub>2</sub>, and the adsorption amount was increased with increment of temperature.

**Key words** [uric acid](#) [medical adsorption material](#) [polyethylenimine](#) [hydrogen bond interaction](#)

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