

研究论文

重金属离子敏感型聚合物胶体晶体的研究

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摘要 以含有双硫键的二丙烯酰胺与双丙烯酸胺作为交联剂, 与单体丙烯酸胺紫外光引发聚合, 嵌入聚苯乙烯胶体晶体, 制备了聚丙烯酰胺胶体晶体水凝胶. 将水凝胶中双硫键打断形成巯基, 利用巯基可与重金属离子偶合的作用, 水凝胶体积收缩而改变胶体晶体中胶粒之间的距离, 根据胶体晶体带隙位移, 可分析水中重金属离子的浓度. 紫外可见光反射图谱表明, 胶体晶体带隙最大可蓝移约80 nm. 带隙移动与时间的关系曲线表明, 胶体晶体水凝胶对重金属离子有较好的灵敏度. 该体系可用于分析铅、镉等重金属离子.

关键词 [胶体晶体](#) [带隙](#) [水凝胶](#) [重金属离子](#) [巯基](#)

分类号

Study of Polymerized Crystalline Colloidal Array for Stimulation of Heavy Metal Cations

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Abstract The polymerized crystalline colloidal array (PCCA) was made by incorporating polystyrene colloidal crystal and bisacrylamidecystamine into polyacrylamide hydrogel. The PCCA with thiol groups could be achieved by the cleavage of disulfide and can be used to reproducibly detect heavy metal cation concentration based on the association between metal cation and thiol groups. UV-VIS reflectance spectra indicate that the PCCA with thiol groups is sensitive to heavy metal cations and the stop band would shift a maximum of 80 nm in Pb(Ac)₂ solution. The PCCA with thiol groups could detect a concentration of different heavy metal cations, such as Pb²⁺, Zn²⁺.

Key words [crystalline colloidal array](#) [bandgap](#) [hydrogel](#) [heavy metal cation](#) [thiol](#)

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