

基于纳米结构氧化锌的水体酚类污染监测研究

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摘要:

利用气相传输法制备了形貌均一、尺寸适当的纳米ZnO棒, 并利用其良好的生物相容性在其表面组装了酪氨酸酶进行酚类物质水体污染的电化学检测传感研究。讨论了ZnO纳米结构制备的条件优化和用于传感的响应结果与影响因素。该传感器对邻苯二酚和苯酚具有快速的安培响应。线性范围分别为0.02~0.12 mM和0.01~0.4 mM, 灵敏度分别为0.83 $\mu\text{A}/\text{mM}$ 和2.14 $\mu\text{A}/\text{mM}$, 检测限分别为15.57 μM 和4 μM , 为纳米结构ZnO在生物化学传感方面的应用展示了广阔的应用前景。

关键词: 生物传感器; 苯酚污染监测; 电化学; 纳米ZnO

The Study of Phenol Pollution Water Detection Based on Nanostructure ZnO

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Abstract:

In present work, ZnO nanorods with uniform size were fabricated through vapor transport method. Based on the biocompatibility of ZnO nano-material, a electrochemistry biosensor for phenol pollution detection is constructed through modification the tyrosinase on ZnO nanorods surface. The fabricated condition for ZnO nanorods and the influence factor of biosensor in detection is discussed. The response of biosensor for phenol and catechol detection is quickly and sensitive. The linearity range of detection for phenol and catechol is respectively 0.02~0.12 mM and 0.01~0.4 mM, sensitivity is respectively 0.83 $\mu\text{A}/\text{mM}$ and 2.14 $\mu\text{A}/\text{mM}$, detection limit is respectively 15.57 μM and 4 μM . That performed a wider prospect for the development and application of ZnO nanostructure biosensor.

Keywords: biosensor; detection for phenolic compounds pollution; electrochemistry; ZnO nanostructure

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