

采用聚吡咯修饰的QCM型三甲胺气体传感器

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摘要:

三甲胺是评估肉类食品新鲜度的重要指标之一, 并且临床上也比较值得关注, 因而三甲胺的检测具有十分重要的意义。为此, 我们采用乳液法制备了聚吡咯材料, 并将其涂敷在晶振电极表面后制得敏感石英晶体微天平(QCM)。根据敏感QCM和参比QCM间的频率差变化来实现气体的检测。在室温条件下, 该气体传感器对三甲胺气体具有较明显的响应。实验从灵敏度、重现性、选择性和稳定性等方面出发, 对该传感器的性能进行了评价。结果表明, 虽然传感器的制备方法简单, 但它的性能优异。

关键词: 导电聚合物; 聚吡咯; QCM; 三甲胺; 气敏传感器

QCM gas sensor based on polypyrrole for trimethylamine detection

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Abstract:

Trimethylamine is a good target for the assay of meat freshness, and also of clinical interest. Therefore, detection of trimethylamine is very meaningful. For this reason, we prepared polypyrrole by emulsion polymerization method, and coated it onto a quartz crystal which was used as the sensing QCM. The change of frequency difference between sensing QCM and reference QCM was used to monitor the atmosphere. When the sensor was exposed to trimethylamine vapor at room temperature, it responded rapidly and obviously. The sensor was characterized in its sensitivity, repeatability, selectivity and long-term stability. The results showed that the performance of sensor was excellent, though the method to prepare it was simple.

Keywords: Conducting polymer; Polypyrrole; QCM; Trimethylamine; Gas sensor

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