电子鼻快速检测谷物霉变的研究

Rapid identification of moldy corn by electronic nose

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英文关键词：corn; identify; gas sensor array; radial basis function(RBF)-neural network

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中文摘要：

针对目前我国在谷物的霉变与否的检测上还有一定的滞后性，研制出一套能快速检测谷物是否霉变的电子鼻装置，该装置能快速、准确地分析所测谷物散发的气味，从而判定所测谷物是否霉变。该电子鼻主要由一组厚膜金属氧化锡气体传感器阵列和RBF神经网络组成。用所研制的电子鼻对小麦、水稻、玉米3种谷物进行检测。整个实验过程如下：首先从每个传感器的反应曲线中提取4个特征值，并对所有特征值进行归一化处理，然后用常规的主成分分析和径向基函数(RBF)神经网络对它们进行分析。实验过程中发现，从主成分分析的结果发现很难将霉变谷物与正常谷

英文摘要：

A novel electronic nose system was developed for the rapid evaluation of moldy corn. It mainly consists of a thick tin oxide gas sensor array and radial basis function(RBF) neural network. This device can evaluate whether the corn is moldy or not by analyzing the gas emitted from the corn. The detection process was introduced as follows: four feature parameters were picked up from the response curve of each sensor, and then were normalized before being analyzed by principal component analysis(PCA) and RBF neural network. The results produced by PCA were demonstrated that it was hard to distinguish the moldy corn from normal samples, while the accuracy of result prouduced by RBF neural network reaches up over 90%. The novel electronic-nose was proved to be more accurate, more convenient and rapid than the traditional methods.

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