传感技术学报

MOS气敏传感器阵列优化与工作温度选择

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摘　要：

通过对金属氧化物半导体(MOS)气敏传感器阵列进行阵列优化和工作温度的选择，达到提高阵列选择性、降低其功耗的目的。实验采用10个MOS传感器组成阵列，在不同加热电压下，对不同浓度的苯、甲苯、甲醇、乙醇进行测试；利用四种特征选择方法进行阵列优化，同时对优化后的特征子集做Fisher线性判别(DFA)分析。结果表明，优化的阵列在比通用加热电压(5.0V)低的加热电压(4.4V)下工作，对四种物质的正确识别率由91.7％提高到100％。

关键词：传感器阵列；温度选择；阵列优化；特征选择；

Array Optimization and the Working Temperature Selection of MOS Sensors

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Abstract:

Through array optimization and the working temperature selection of sensor array could improve the selectivity of sensor array and reduce the power consumption. In the experiment, a gas sensor array consisted of ten TGS sensors was used to test benzene, toluene, methanol, ethanol at different concentrations when sensor arrays worked at different temperatures. Then through four methods of feature selection for array optimization, the DFA results of optimal feature at different temperatures were compared. Results showd that it could improve selectivity (the correct recognition rate increased to 100% from 91.7%) and reduce power consumption of sensor array at the best working temperature 4.4V comparing with the traditional work temperature 5.0V.

Keywords: sensor array; temperature selection；array optimization；feature selection

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