

Title Optimization of sensor array and detection of stored duration of wheat by electronic nose
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Abstract

An electronic nose (PEN 2) comprising ten metal oxide semiconductor sensors (W1C, W5S, W3C, W6S, W5C, W1S, W1W, W2S, W2W, W3S) were used to detection of five different stored duration wheats (wheats were harvested from 2000 to 2004, and named as W00, W01, W02, W03, and W04, respectively). A few of sensors were switched-off by multivariate analysis of variance and loading analysis. The responses signals of sensor W5C, W1S, W1W, W2S, W2W and W3S were chose for the pattern recognition. Principal component analysis (PCA) was applied to the signal of optimized sensor array, the five different stored duration of wheat were discriminated well and each group has strong convergence. The results obtained by network I (for optimized sensor array) presented the higher percent of correct classifications in comparison to network II (for original sensor array). The optimization of sensor array can improve the recognition performance of the electronic nose. The results obtained indicated that the electronic nose could discriminate successfully wheat of different age.