

KCL is a pulp and paper company generating new information for the industry. KCL carries out research in pulping. Research covers the entire process from raw materials to the four-colour printed end product



«An electronic nose has been found to be a useful tool in controlling the quality of food packaging board. The nose identifies paperboard from which off-flavour transfers into the packaged food. Usually, off-flavour is evaluated by a sensory panel, which consists of 8 - 10 people trained to make a sensory evaluation. Before the evaluation, the sample to be examined is kept for 48 hours in the same container with a reference foodstuff, usually chocolate. The members of the panel then taste the chocolate and determine whether any off-flavour has been transferred to the chocolate from the paperboard being examined. Sensory evaluation of samples is very time-consuming and requires numerous trained people for the panel. For this reason, some other method to replace sensory evaluation has been sought

Electronic Nose results correlated with sensory panel score

KCL conducted a study to determine whether the electronic nose is capable of differentiating between samples of food packaging materials with different sensory properties. The study showed that the nose can pick out the samples from which off-flavour is transferred, in agreement with the findings of KCL's trained panel of sensory testing experts..

Testing at KCL

The electronic nose has been found to detect taint in a food packaging board, especially in cases where various autoxidation products (such as hexanal and other aldehydes) have been produced in the paperboard, for example as a result of storage. The nose is also suitable for examining various multiply packaging materials. .The best way to verify the suitability of the electronic nose for product quality control is to test it in practice. This can be done at KCL. To confirm its suitability for a given purpose, the nose needs to be tested both with samples from normal production and samples which the nose is expected to pick out -i.e. both good and bad samples”.



The results produced by the electronic nose are compared with the properties determined by sensory testing. To ensure correct interpretation of the results, often data is required on the volatile compounds emitted from the sample. This is because the nose does not analyse volatile compounds, it only characterizes their combined effect. In practice, the electronic nose has been found to detect smaller differences between samples than sensory testing,

In quality control, the electronic nose offers a means to study large numbers of samples and to find quickly the samples that deviate from normal production.»

Marja Pitkänen and Birgit Aurela, KCL