



News in science

Artificial nose sees smell

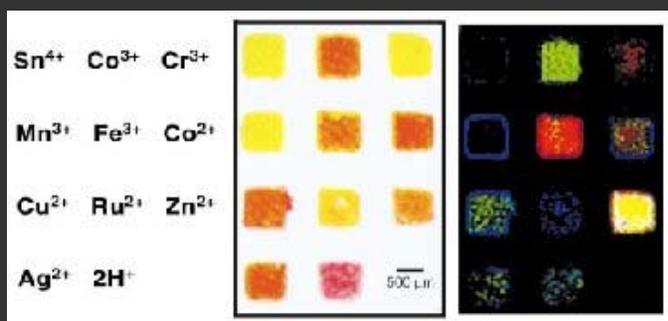
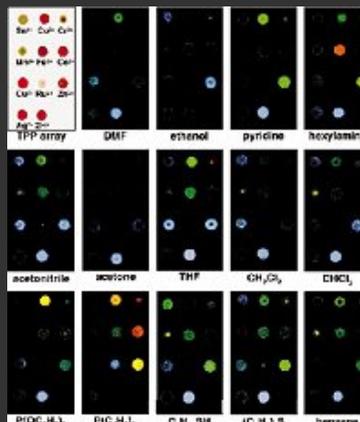
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US researchers have developed a small slip of paper that can sniff out food contaminants, counterfeit perfumes, banned drugs and toxic gases simply by changing colour.

A report in this week's journal *Nature* reports on the artificial nose that can visualise odours developed by chemists at the University of Illinois.

Called "smell-seeing" by its inventors, the technique is based on colour changes that occur in an array of vapour-sensitive dyes known as metalloporphyrins - doughnut-shaped molecules closely related to the red haemoglobin pigment in blood and the green chlorophyll pigment in plants.

"Our technique is similar to using litmus paper to determine if a solution is acid by seeing if the paper goes from blue to pink," explains researcher Kenneth Suslick. "But we have generalised it so a whole range of chemical properties are being screened by an array of many different dyes that change colour when they interact with different chemicals. The resulting changes in the array provide a colour fingerprint unique to each vapour."



The researchers create the array by painting an inert surface such as paper, plastic or glass with a series of dots of different dyes. The array colour changes after it is

exposed to different odour-producing substances giving each vapour mixture its own 'fingerprint'. The colour intensity accurately indicates chemical concentration, even for very low amounts.

"The human nose is generally sensitive to most compounds at a level of a few parts per million," Suslick said. "The sensitivity of our artificial nose is 10 to 100 times better than that for many compounds."

And unlike other potential artificial nose systems, smell-seeing is not

affected by changes in relative humidity.

Smell-seeing arrays have many potential applications, such as in the food and beverage industry to detect the presence of flavourings, additives or spoilage; in the perfume industry to identify counterfeit products; at customs checkpoints to detect banned plant materials, fruits and vegetables; and in the chemical workplace to detect and monitor poisons or toxins.

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