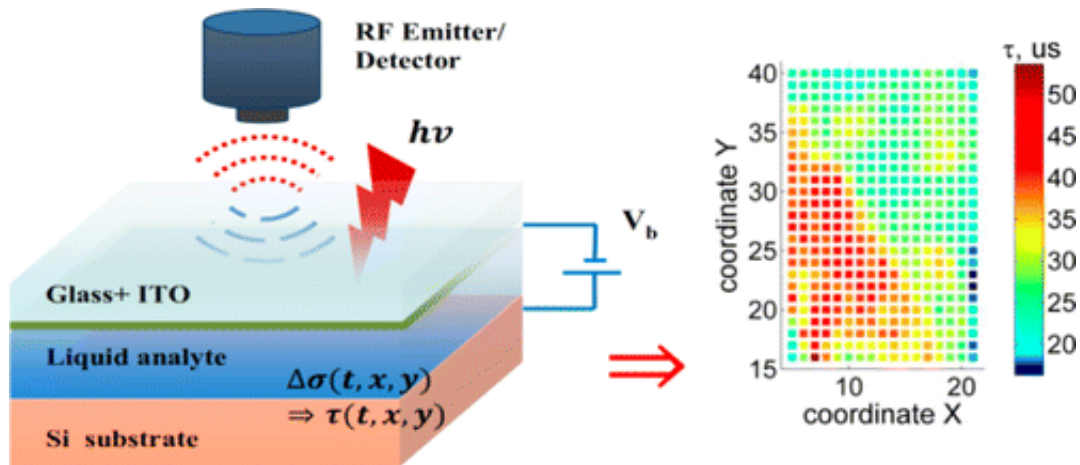


# Electronic 'tongue' to ensure food quality

November 12 2014



An electronic "tongue" could one day sample food and drinks as a quality check before they hit store shelves. Or it could someday monitor water for pollutants or test blood for signs of disease. With an eye toward these applications, scientists are reporting the development of a new, inexpensive and highly sensitive version of such a device in the journal *ACS Applied Materials & Interfaces*.

S. V. Litvinenko and colleagues explain that an [electronic tongue](#) is an analytical instrument that mimics how people and other mammals distinguish tastes. Tiny sensors detect substances in a sample and send signals to a computer for processing just as taste buds sense and transmit flavor messages to the brain. The food and beverage industry and others

have started deploying electronic tongues for a range of purposes from authenticating Thai food to measuring beer quality. But existing devices are limited in how they can be used. Litvinenko's team decided to make an improved instrument that could have applications in medical diagnostics, pharmaceutical testing and environmental monitoring, as well as [food](#) testing.

The researchers developed a low-cost and environmentally friendly "e-tongue" with a silicon base that could be easily incorporated into existing electronic systems of the same material. When they tested it with Armagnac, cognac, whiskey and water, they were able to establish precise signatures for each. They conclude that their work serves as a first step toward a novel tasting instrument with potentially diverse applications.

**More information:** "Might Silicon Surface Be Used for Electronic Tongue Application?" *ACS Appl. Mater. Interfaces*, 2014, 6 (21), pp 18440–18444. [DOI: 10.1021/am5058162](https://doi.org/10.1021/am5058162)

### **Abstract**

An electronic tongue concept based on 2D mapping of photogenerated charge carrier lifetimes in silicon put in contact with different liquids is reported. Such method based on intrinsic sensitivity of the silicon surface states to the surrounding studied liquids allows creation of their characteristic electronic fingerprints. To increase recognition reliability, a set of characteristic fingerprints for a given liquid/silicon interface is proposed to be recorded at different bias voltages. The applicative potential of our sensing concept was demonstrated for different spirits and water samples.

Provided by American Chemical Society

Citation: Electronic 'tongue' to ensure food quality (2014, November 12) retrieved 11 July 2024 from <https://phys.org/news/2014-11-electronic-tongue-food-quality.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.