

NEW INEXPENSIVE SENSOR CAN DETECT TOXIC CHEMICALS IN FOOD

Relevant for: Indian Economy | Topic: Food processing and related industries in India: scope and significance, location, upstream and downstream requirements and supply chain management

To enjoy additional benefits

CONNECT WITH US

December 27, 2022 05:40 pm | Updated 05:40 pm IST

COMMENTS

SHARE

READ LATER

The researchers noted that the sensor can discriminate the formaldehyde from other analogues spectroscopically in parts per million (ppm) concentrations. Image for Representation. | Photo Credit: Reuters

Researchers have developed a new cost-effective sensor that can detect toxic chemicals such as formalin in food samples like preserved meat, fish and honey.

The team at Shiv Nadar Institution of Eminence Delhi-NCR noted that the chemical sensor for monitoring environmental pollutants offers a cost-effective, easy synthesis and excellent water solubility.

The chemosensor, described in the journal ChemComm, also provides good sensing ability to formaldehyde or formalin -- a naturally occurring organic compound -- upto 0.3 micro Moles (μM).

According to the Food Safety and Standards of India (FSSAI) regulation 2011, formalin is not permitted for use in food.

However, the chemical is often used as a preservative for fish and meat. It is also used as a disinfectant for treating external parasites and fungi in aquaculture.

The researchers noted that the sensor can discriminate the formaldehyde from other analogues spectroscopically in parts per million (ppm) concentrations. It also can be visually monitored at higher concentrations.

The detection method can monitor formaldehyde in real samples, including preserved fish and chicken. It can also quantify other analogues in honey such as methyl glyoxal (MGO).

[Also Read | 'Use of chemicals to ripen fruits amounts to poisoning consumers'](#)

"We have used a simple optical method, especially fluorescence, to detect formaldehyde," Anumesh Samanta, Assistant Professor, Department of Chemistry, School of Natural Sciences, Shiv Nadar Institution of Eminence.

"Low concentrations of formaldehyde can be detected by fluorimeter, and higher concentrations can be detected by the naked eye using a simple UV torch. This sensing method is easy and inexpensive for real sample analysis, including preserved fish and honey," Samanta told PTI.

Current fluorescent-based small molecular sensors for formaldehyde are either partially or not soluble in an aqueous solution, limiting the real application in preserved food samples, the researchers said.

A few colorimetric chemosensors or test kits have been developed, but these are not sensitive like fluorescence techniques, they said.

An alternative highly water soluble fluorescence-based small molecular chemosensor was urgently needed to develop, according to the researchers.

Samantha said from a chemistry point of view, the detection of reactive carbonyl species (RCSs) is solely dependent on the o-phenylenediamine (OPD) derivatives.

However, none of the current chemical sensors are effective for simultaneous detection and discrimination among formaldehyde and other analogues, such as methyl glyoxal (MGO).

"Our design principle, its synthesis, and application are unique compared to similar studies in this research field," said Samanta.

"This research is a proof-of-concept and a practical demonstration of analysing toxic pollutants in food samples," he added.

The research team is trying to develop a test kit that can be detected by mobile onsite instead of using any spectrophotometer, Samanta added.

COMMENTS

SHARE

[food](#) / [chemicals](#) / [meat](#) / [food safety](#)

BACK TO TOP

Comments have to be in English, and in full sentences. They cannot be abusive or personal. Please abide by our [community guidelines](#) for posting your comments.

We have migrated to a new commenting platform. If you are already a registered user of The Hindu and logged in, you may continue to engage with our articles. If you do not have an account please register and login to post comments. Users can access their older comments by logging into their accounts on Vuukle.

END

Downloaded from **crackIAS.com**

© **Zuccess App** by crackIAS.com