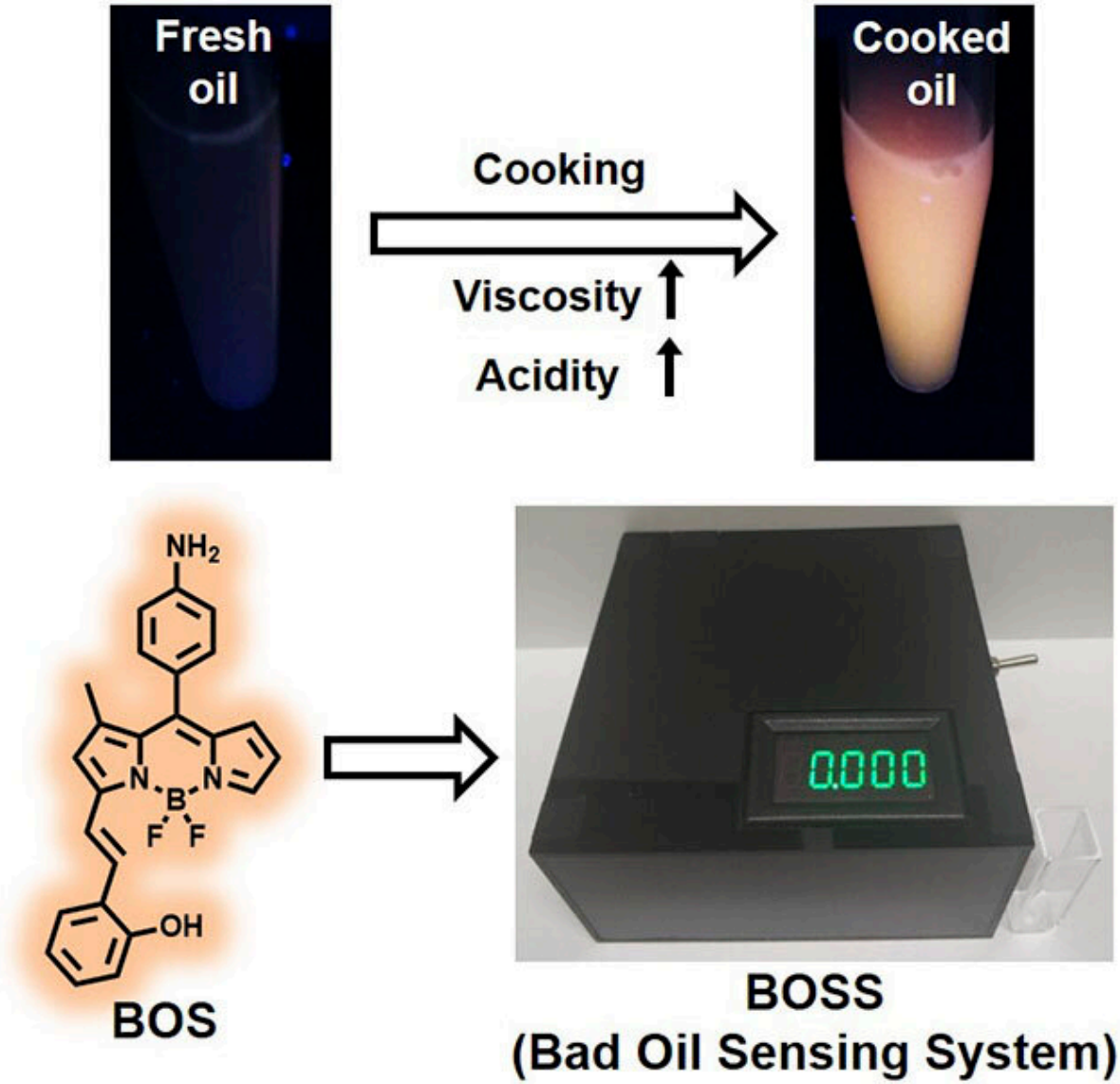


Portable fluorescent probe identifies bad cooking oil

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BOS (Bad Oil Sensor), a fluorescent sensor that easily detects bad cooking oil, and BOSS (Bad Oil Sensing System), its portable platform.

Credit: Pohang University of Science and Technology

How clean are the cooking oils we use in our homes? What about the cooking oils used at restaurants? Recently, a team of researchers has developed a straightforward and highly sensitive technology that detects bad cooking oils.

A research team led by Professor Young-Tae Chang of the Department of Chemistry at POSTECH (Associate director of Center for Self-assembly and Complexity at the Institute for Basic Science (IBS)) and Dr. Xiao Liu of IBS has developed the fluorescent molecular probe, BOS (Bad Oil Sensor), for highly sensitive detection of bad cooking oils for the first time in the world. Fluorescent sensors are photoluminescent sensors that indicate whether a specific ion or substance is detected through a light signal.

The research findings were recently published in the international journal *Sensors and Actuators B: Chemical*.

When cooking oil is used for an extended period, harmful chemicals are generated. Unfortunately, some of this adulterated oil is used to make food and sold to consumers. However, the conventional detection method is not easily accessible to the public because it requires expensive equipment and professional skills. Moreover, it is merely an indirect method that measures only the acidity of bad cooking oils or detects impurities added during the [cooking process](#), rendering it difficult to apply to all types of oils.

To improve the detection method, the research team fabricated a fluorescent molecular sensor that anyone can use to measure the cooking

extent accurately. This sensor uses a dual turn-on method that detects both the viscosity and acidity that inevitably change during the cooking process. It can accurately measure how long the cooking oil was used regardless of the ingredient, and even detects a small amount of bad oil mixed with fresh oil.

The research team also developed a portable platform named Bad Oil Sensing System (BOSS) for immediate use. It is a widely applicable tool to monitor the quality of cooking oil by consumers and the [food industry](#).

More information: Xiao Liu et al, Casting red light for bad oil by dual turning-on mechanisms of fluorescence and its application in the portable platform, *Sensors and Actuators B: Chemical* (2022). [DOI: 10.1016/j.snb.2022.131866](#)

Provided by Pohang University of Science and Technology

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