Showcasing research from Professor Junhong Chen's laboratory, Pritzker School of Molecular Engineering, University of Chicago, Illinois, United States.

A portable and reusable sensor system based on graphene for real-time and sensitive detection of lead ions in water

In this study, we demonstrate a fully portable sensor system enabling rapid, sensitive, and real-time monitoring of Pb^{2+}. The sensor system adopts the remote-gate field-effect transistor (RGFET) detection scheme and is easy to operate, even for non-experts. To achieve a high sensitivity for Pb^{2+}, we utilize graphene ink drop-casted on the sensor PCB as a sensing membrane and modify it with the 1-pyrenebutyric acid (PBA) probe. The sensor system is further linked to a smartphone application that instantly displays the sensor response, allowing for rapid point-of-use detection.

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See Junhong Chen *et al.*, *Environ. Sci.: Nano*, 2025, **12**, 1840.

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