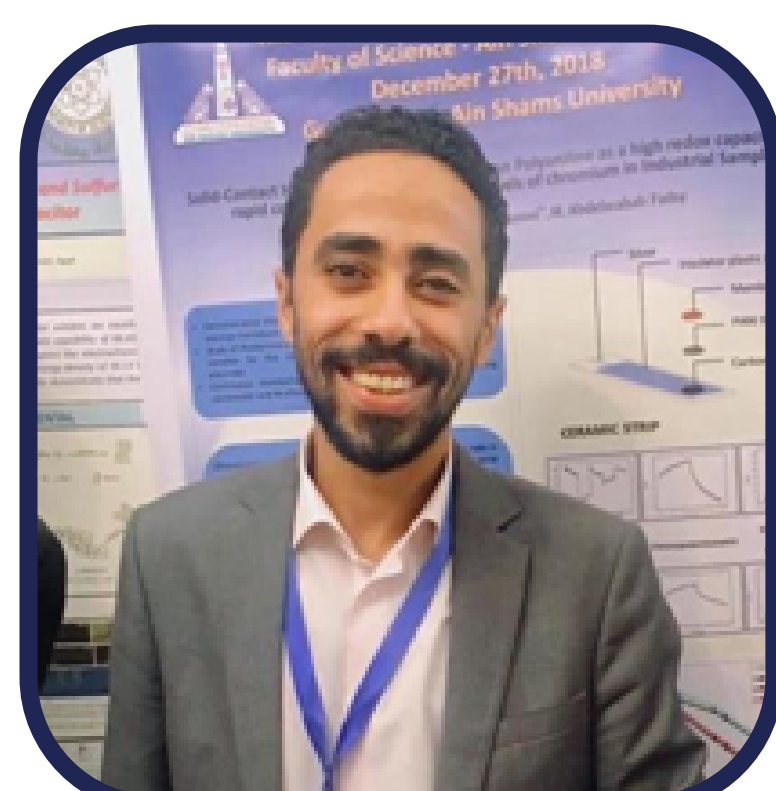


# GLOBAL E-CONFERENCE ON CHEMISTRY AND CHEMICAL ENGINEERING

## APRIL 05-06, 2023 | WEBINAR



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#### Low-Cost Potentiometric Sensors Based on Disposable Paper Strips for Monitoring of Toxic Pollutants

Potentiometric sensors are smart and efficient analytical technology with additional attractive benefits due to their fast stable response, low cost, simplicity in preparation and application in various fields, including clinical, industrial and environmental analyses. These sensors consist of two main parts: Recognition and Transducer. As a result of the tremendous and continuous development in the applications and designs of the ion-selective electrodes (ISEs) from conventional electrodes (containing inner filling solutions) to solid-state electrodes (coated wire and planar types) to overcome the drawbacks of the conventional design. In the present work, paper-based sensors have been described and used for monitoring toxic environmental pollutants. Advantages offered by this type of sensors are: Eco-friendly nature, low cost, flexibility, light weight and compatibility with biological samples, fast and stable response, accurate results, mass production, ease of miniaturization.

These types of potentiometric sensors fall under the concept of green electronics due to their safe nature, which can be easily disposed without damage to the environment. Paper-based potentiometric sensors, as described in this work (Fig. 1) depend on the use of a paper strips as a flexible substrate. The main component of the substrate is cellulose, an ideal candidate for use in all clinical and decentralized wearable potentiometric sensors (WPSs). Furthermore, the porous nature of the paper substrate makes it easy to absorb conductive materials or recognition elements by physical adsorption, chemical coupling, coating or deposition of the electroactive recognition material on its surface.

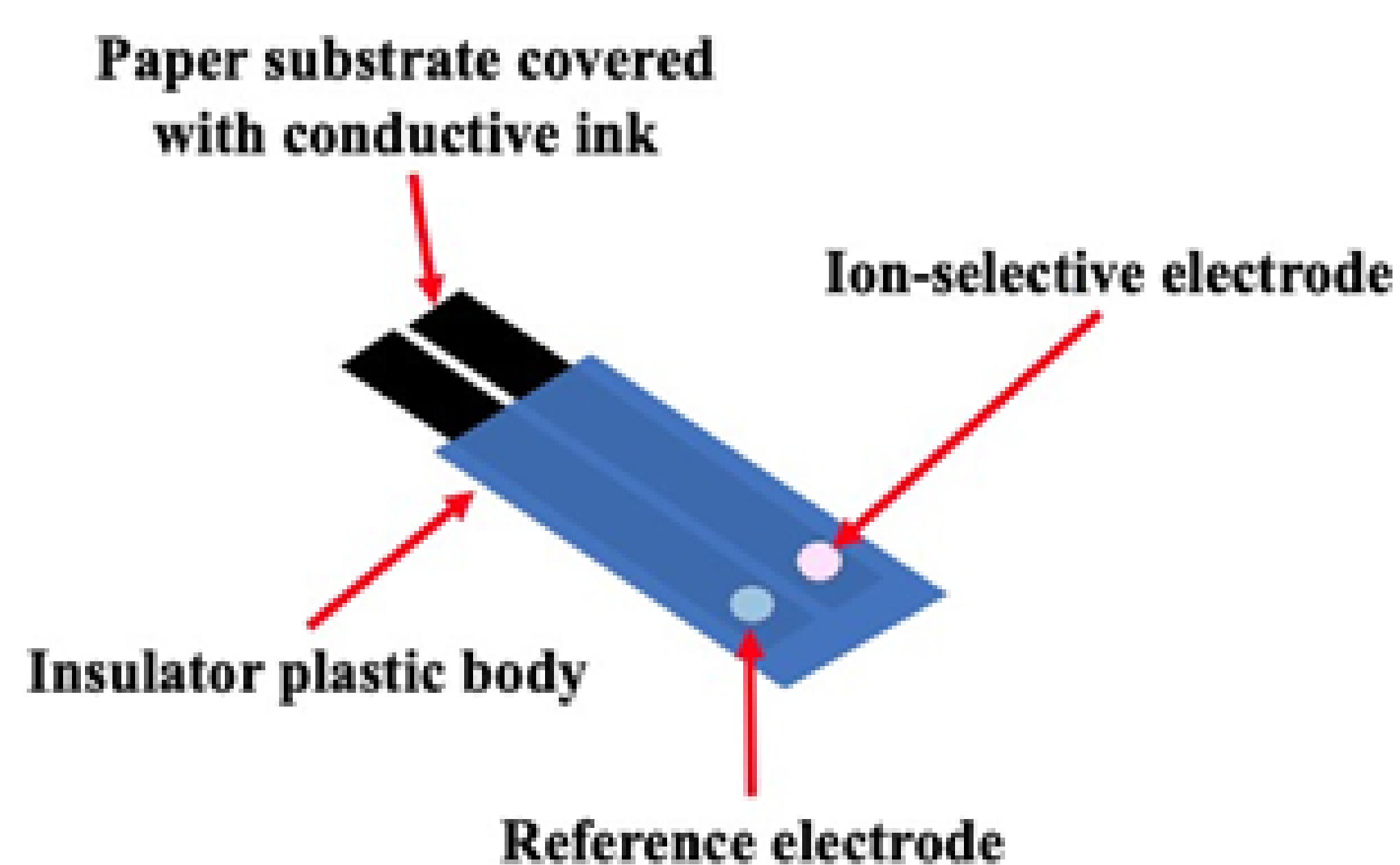


Figure 1. The structural components of the all-solid-state paper-based combined sensors.

**Keywords:** Paper-based sensor, Potentiometric sensor, Ion-selective-electrode, Solid-contact material, Wearable sensor

#### Biography:

**Dr. Mahmoud Abdelwahab Fathy Sayed**, Received his Ph.D. degree from Ain Shams University, Cairo, Egypt in August 2022. He is a Lecturer of Analytical Chemistry at Ain Shams University. His main research interests are in the design and development of electrochemical/potentiometric sensors for environmental and biomedical applications. He awarded the Innovation Award from Ain Shams University (Researchers Track) in July 2022, with a research project titled "Wearable Sensors"