

Laser-Induced Graphene: Affordable Fabrication for Electrochemical Sensors

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Graphene-based materials have garnered significant interest in electrochemical sensing owing to their exceptional properties, including high surface areas, superior conductivity, and electrocatalytic behavior [1]. Among these materials, Laser-Induced Graphene (LIG) has emerged as particularly promising. LIG can be precisely patterned on flexible substrates under ambient conditions through a rapid and straightforward laser irradiation process. In this short course, we focus on the straightforward and cost-effective fabrication of electrochemical sensors utilizing laser-induced graphene. These sensors hold immense potential for detecting various molecules, thus finding applications in healthcare and environmental monitoring. Participants will learn to fabricate electrochemical sensors by employing a basic laser engraver machine operating under mild power conditions (1.5 W laser power at 405 nm) and utilizing simple substrates like polyimide and paper. Through a combination of theoretical discussions and practical demonstrations, attendees will gain insights into the fabrication process and characterization techniques, including electrical and electrochemical measurements such as cyclic voltammetry. This course offers a unique opportunity to explore the versatility and accessibility of laser-induced graphene-based sensors, fostering innovation in sensor technology for diverse applications.

[1] Zhao, L. *et al.* *ACS Appl. Mater. Interfaces* (2023) doi:10.1021/acsami.2c20859.