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Shrimp shell-derived porous carbon and Cu-melamine metal-organic frameworks composite modified electrode for sensitive electrochemical determination of hydroquinone

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A novel electrochemical sensor based on shrimp shell-derived porous carbon (SSPC) and Cu-melamine (Cu-Me) metal-organic frameworks composite modified electrode was proposed for sensitive determination of hydroquinone (HQ). The SSPC has the enlarged active surface area, the increased conductivity, and the loading ability of Cu-Me. Attributed to these impressive features, the detection signals of HQ is greatly amplified on the SSPC/Cu-Me modified glassy carbon electrode (GCE). Under the optimized conditions, the current response of HQ on SSPC/Cu-Me/GCE is linear in the range of 5.0-1800.0 μmol/L with detection limit down to 1.83 μmol/L (3σ). The SSPC/Cu-Me/GCE exhibited excellent selectivity, stability, and reproducibility, which was utilized to detect HQ successfully in lake water sample with satisfactory recoveries. This work is expected to attract greater attention to biomass/MOF composites for electrochemical sensing.

Keywords: Shrimp shell-derived porous carbon; Cu-melamine; Composite; Hydroquinone; Electrochemical determination

FULL TEXT