

Microwave-assisted Synthesis of Mesoporous Carbon for Highly Selective Determination of Dopamine

Pitchaimani Veerakumar,^a Rajesh Madhu,^b Shen-Ming Chen (陳生明),^{b,*} and Shang-Bin Liu (劉尚斌)^{a,c,*}

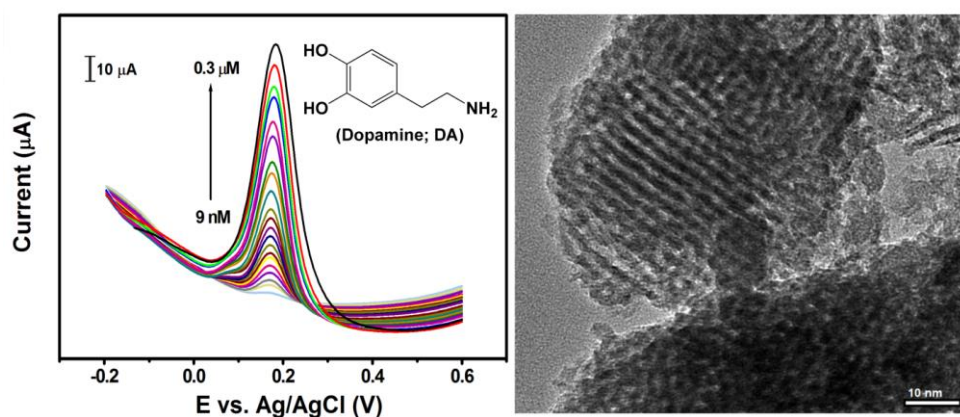
^aInstitute of Atomic & Molecular Sciences, Academia Sinica, Taipei 10617, Taiwan

^bDept. of Chemical Engineering and Biotechnology, National Taipei University of Technology, Taipei 10608 Taiwan

^cDepartment of Chemistry, National Taiwan Normal University, Taipei 11677, Taiwan

*E-mails: smchen@ntut.edu.tw, sbliu@sinica.edu.tw; NSC Project No.: NSC101-2113-M-001-020-MY3

Carbon porous materials (CPMs) with high surface areas up to 2,660 m²/g were fabricated by a simple microwave-assisted route using resorcinol-formaldehyde (RF) resol as the carbon precursor and amphiphilic Pluronic F-127 surfactant as the structural directing agent. CPM-modified electrodes were applied for electrochemical detection of dopamine (DA). Their electrocatalytic performances were assessed by cyclic voltammetry (CV) and differential pulse voltammetry (DPV). It is found that such modified electrode show a linear correlation between peak current and DA concentration (9.0 nM to 0.3 μM). The CPM-modified electrode also exhibits excellent detection limit (2.9 nM) and extraordinary sensitivity (2.56 mAμM⁻¹cm²) for the detection of DA even in the presence of large amount of foreign species, such as ascorbic acid (AA) and uric acid (UA), surpassing the conventional glassy carbon electrode (GCE) and other modified electrodes. Moreover, we report superior stability, reproducibility, and selectivity of the new CPM-modified electrode, which should have important practical application as DA sensor in biological sample systems even in the presence of foreign species.



Keywords: Microwave-assisted synthesis; Carbon porous material; Dopamine; Biosensor

報告型式：☐口頭 ☒海報 ☐皆可

是否參加學生壁報論文競賽：☐是 ☒否

(註：參加口頭報告者亦可參加學生壁報論文競賽，但須準備海報、全文及簡報等相關資料，依**學生壁報論文競賽獎評選辦法**中所規定之方式辦理。)