

Bi-metallic Zeolite Imidazole Framework Nanofibres for Selective Determination of Cd²⁺ ion

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Material preparation

Preparation of Co-ZIF powder.

For the preparation of Co-ZIF powder, 0.05 M of $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ and 0.8 M of 1-methylbenzimidazole (Me) were prepared using ethanol as a solvent. These two solutions were mixed with the aid of magnetic stirrer at room temperature, and this process is continued for 1 hr, resulted in the formation of blue precipitate of Co-ZIF. Then the blue color precipitate was washed with DI water and ethanol consecutively. The obtained precipitate was kept at 70 °C for 12 h. The resulted Co-ZIF powder was utilized further as a precursor for electrospinning to form continuous microfibers.

Preparation of Co-ZIF fibers using electrospinning method.

For fiber preparation, 2.64 g of Co-ZIF powder was mixed with 1ml of dimethylformamide (DMF) as a solvent and the mixture kept in sonication for 30 min. Later, 0.0875 g of polyacrylonitrile (PAN) was added as polymeric source and stirred for 24 hr. This mixture was utilized as a precursor material for electrospinning and taken in a 2 ml syringe. The electrospinning method was subjected by an applying a DC voltage of 15 kV. The conditions regarding fibers were optimized as follows: the distance between syringe and drum collector was 20 cm, drum collector rotation speed was 165 rpm and the flow rate was 0.15 ml per hour. The as resulted Co-ZIF fibers were dried under ambient condition for 6 hr at and this was denoted as Co-ZIF fibers.

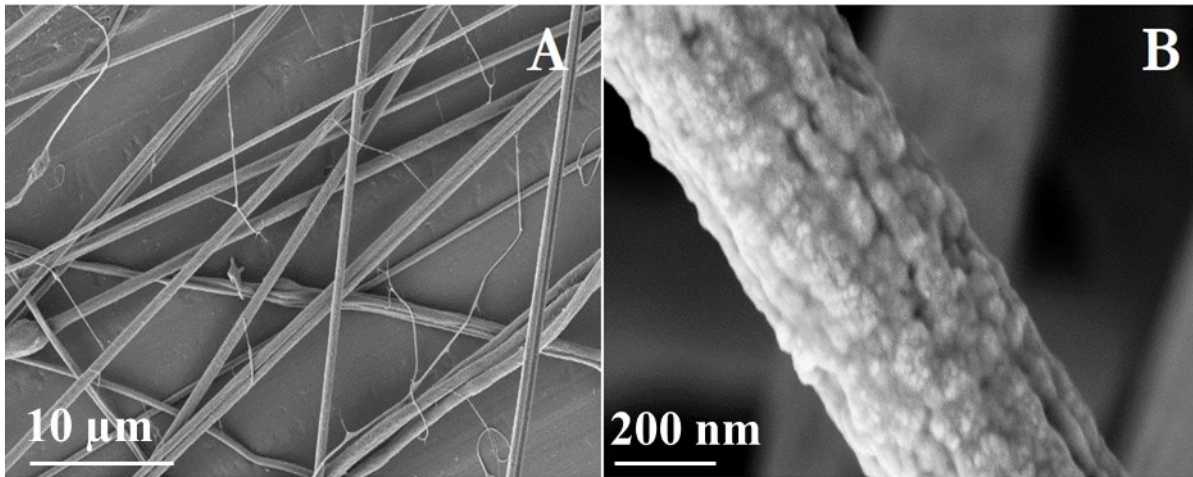


Figure S1. Low and high magnified FE-SEM image of Co-ZIF microfiber.

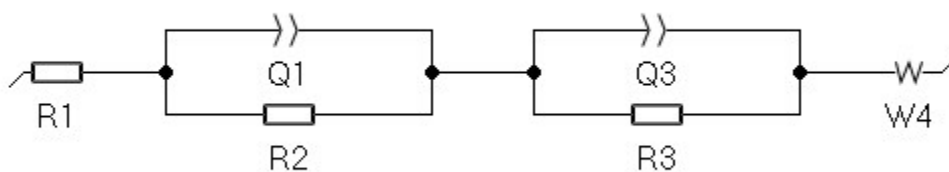
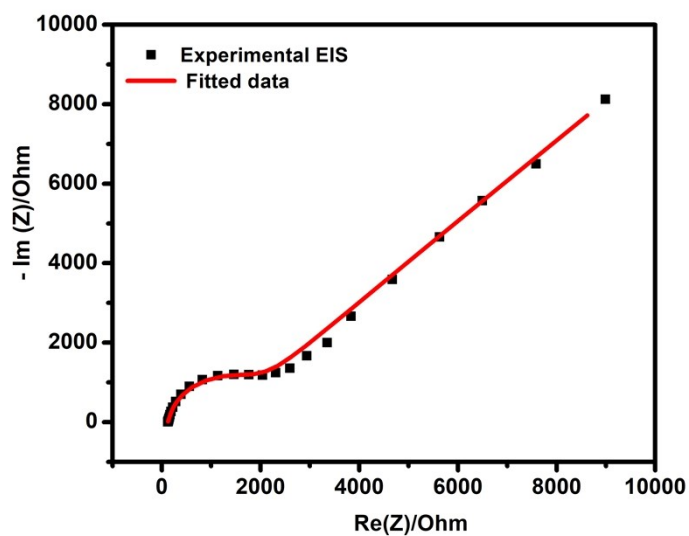


Figure S2. EIS fitted data plot for Co/Zn-ZIF NFs modified GCE in 1 mM $[\text{Fe}(\text{CN})_6]^{3-/4-}$ in 0.1 M KCl at a scan rate 50 mV s^{-1} and its equivalent fitted circuit diagram.

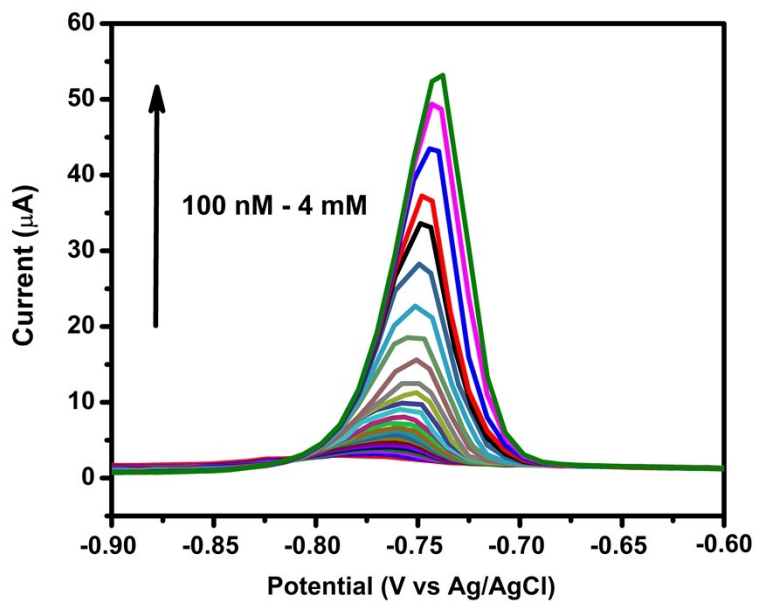


Figure S3. Square Wave Voltammetry of Co/Zn-ZIF NFs modified GCE varies from 100 nM-4mM of analyte solution in pH 9.