



## Construction of specific nickel-based electrode using N,N-dimethylformamide/water as solvent and the application in metronidazole detection

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### ABSTRACT

To achieve rapid detection for metronidazole (MNZ), a mesoporous nickel-based metal–organic framework (Ni-MOF), which had sub-micron-assemblies of layered flakes and abundant carboxyl groups, was synthesized in a particular solvent containing water with a facile one-step hydrothermal method. Using Ni-MOF/multi-walled carbon nanotubes as the sensor electrode, cyclic voltammetry and differential pulse voltammetry were investigated in MNZ solution (containing 0.1 M PBS). The current response linearly varied with MNZ's concentration in the range of 5–100  $\mu$ M. A relatively low detection limit of 25 nM was obtained, which outperformed many electrochemical platforms for MNZ reported in literatures. Moreover, further investigations indicated this system was endowed with good anti-interference ability repeatability, and long-term stability. The present work was promising to pave the way for the quantitation of MNZ in biomedical and healthcare applications.

**Keywords:** Metal–organic framework; Metronidazole; Electrochemical sensor; Residue detection

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