

## Synthesis Modified Electrodes with Au/Pt Nanoparticles and Two New Coordination Polymers of Ag(I) and Cu(II) Constructed by Pyrazine and 3-Nitrophthalic Acid as a Novel Electrochemical Sensing Platform

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**Abstract :** Two new one and two dimensional metal organic coordination polymers of Cu(II),  $[\text{Cu}(\text{3-nph})_2(\text{H}_2\text{O})_2\text{pz}]_n$  (1) and Ag(I),  $\{[\text{Ag}(\text{3-nph})\text{pz}]\cdot\text{H}_2\text{O}\}_n$  (2) with pyrazine (pz) and 3-nitrophthalic acid (3-nph) have been synthesized and characterized by elemental analysis, spectral (IR, UV-Vis), thermal (TG/DTG) analysis and single crystal X-ray diffraction. We used these compounds to preparation modified electrode with Au/Pt nanoparticles in order to investigation electrochemistry and electrocatalysis activities. The surface structure and composition of the sensor were characterized by scanning electron microscopy (SEM). The Ag(I) coordination polymer shows a 2D layer structure constructed from dinuclear silver (I) building blocks in which two crystallographically  $\text{Ag}^+$  ions are connected to each other by a covalent bond. The pyrazine ligands adopt  $\mu_2$  bridging modes, linking the metal centers into a one and two -dimensional coordination framework in 1 and 2. The two AgI cations are surrounded by pyrazine and 3-nitrophthalate mono anions and indicate distorted tetrahedral geometry. In the crystal structures of Ag(I) complex there are non-classical hydrogen bonding arrangements,  $\text{C}-\text{O}\cdots\pi$  and  $\pi-\pi$  stacking interactions. In Cu(II) coordination polymer, the coordination geometry around Cu(II) atom is a distorted octahedron. Interestingly, the structural analysis illustrates that the strong and weak hydrogen bond accompanied with  $\text{C}-\text{H}\cdots\pi$  and  $\text{C}-\text{O}\cdots\pi$  stacking interactions assemble the crystal structure of 1 and 2 into fascinating 3D supramolecular architecture.

**Keywords :** 3-nitrophthalic acid, crystal structure, coordination polymer, electrocatalysis

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