Triazine Based 2D Coordination Polymers for New Non-Enzyme Glucose Sensing

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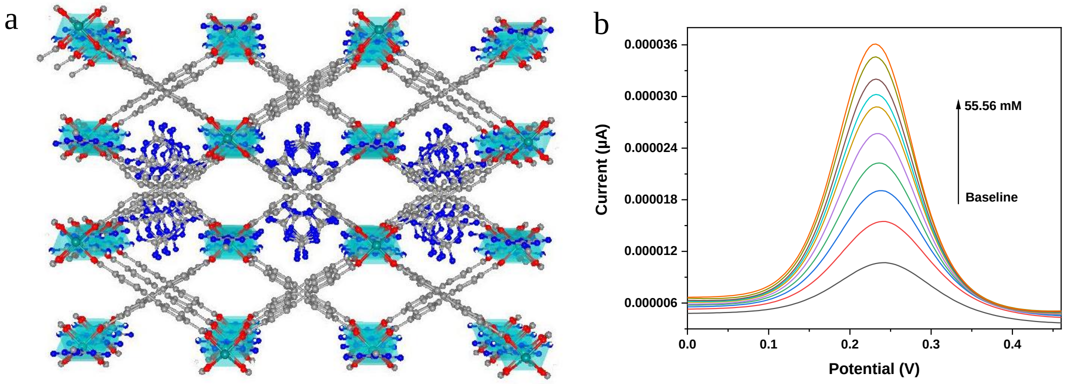

Fig. 1 View of the rendered structure (a) and the performance on glucose sensing(b)

With potential utility as an electrochemical biosensor in mind, the triazine based 2D coordination polymer Zn(BPDC)Mel incorporating melamine (Mel) was designed and synthesized in our study. The water and chemical stability of Zn(BPDC)Mel were confirmed by powder X-ray diffraction analysis. It was established that Zn(BPDC)Mel could selectively identify glucose and be used as an efficient catalyst electrode for glucose oxidation under weak alkaline conditions in the $[Fe(CN)_6]^{3-/4-}$ system. The activity of Zn(BPDC)Mel towards glucose is attributed to triazine incorporation, which coordinate to give potential glucose identification sites. The Zn(BPDC)Mel/Glassy Carbon electrode exhibits accurate clinical performance characteristics with a linear range from 5.6 μM to 5.56 mM ($R^2 = 0.96$) when used as a non-enzymatic glucose sensor, as demonstrated electrochemically. Low sample loadings (8ul) and rapid detection times (60 seconds) are another pair of distinct advantages of our MOF biosensor system.

Reference:

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