Supplementary material

Spectroscopic Characterization of H₆[P₂Mo₁₈O₆₂](P₂Mo₁₈)

The structure of P_2Mo_{18} was analyzed by UV/Vis spectrum and FT/IR spectrum. In the UV/Vis spectrum (Fig.S1), P_2Mo_{18} shows a characteristic absorption peak at a wavelength of 213 nm. The characteristic peaks of Dawson-type structure appear between 700 and 1100 cm⁻¹, which are P-Oa bond tensile vibration absorption peak, Mo-Od bond tensile vibration absorption peak, Mo-Ob-Mo bond tensile vibration absorption peak and Mo-Oc-Mo bond tensile vibrational absorption peak (Fig.S2 a and Fig.S2 b). The characteristic peaks of the synthesized compounds are consistent with those in reference, and they are identified as target compounds. The structure of the obtained compound was detected by X-ray powder diffraction, and compared with the XRD pattern of P_2Mo_{18} in the literature, it was found that the XRD patterns of the two were basically the same, indicating that the synthesized compound was P_2Mo_{18} .



Fig.1S UV / Vis spectrum of P_2Mo_{18}







(b) FT/IR spectrum of P_2Mo_{18} in the band where the characteristic peak of the Dawson structure

appears



Fig.3S XRD pattern of P2Mo18

Characterization of [(PSS/PPy)(P2Mo18/PPy)5] composite multilayer modified electrode

It can be seen from Fig.4S that the spherical material on the electrode surface is P_2Mo_{18} . P_2Mo_{18} is uniformly deposited on the surface of the glassy carbon electrode, and most of the particles have a particle size of about 10 nm. It shows that P_2Mo_{18} and other substances form a nano-scale composite film on the modified electrode.



Fig.4S The SEM image of [(PSS/PPy)(P2M018/PPy)5] composite multilayer film modified

electrode