

Pt ion-driven peptide self-assembly for a novel Pt@PEP nanostructure : peroxidase mimic nanocatalyst for TMB oxidation

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Peptide is one of the representative biomaterials determining the self-assembly phenomenon which is related with several human disease. Metal ions or metal nanoparticles can take important roles in creating a peptide self-assembly. Tyrosine which acts as biocatalyst is known to have potential for chelating effect with metal ion. Here, we reported a Pt@PEP nanostructure as a novel metal ion-organic framework using tyrosine rich peptide(YYACAYY). The resulting Pt ion-complexed peptide nanostructure was confirmed as spherical type by TEM analysis. It was furtherly characterized by UV/Vis, XRD, FT-IR, XPS. Pt ion-driven peptide nanostructures exhibited a peroxidase mimetic activity. We screened TMB oxidation driven by Pt ion stabilized with tyrosine residue. Without any reduction for Pt nanoparticle, it has been proven that this Pt@PEP nanostructure is showing an excellent activity. Therefore, the proposed simple approach would be convenient and satisfactory analytical methods for a colorimetric immunoassay as novel nanocatalyst.