

Novel Pd ion-driven peptide nanostructure as oxidative catalyst

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In biological systems, peptide can form specific self-assembled nanostructures which conduct diverse functionality. Also peptide is utilized electronic material and catalyst system by conjugating with metal ions or nanoparticles through self-assembly. Palladium is good catalyst in redox reaction because it can accept electron from other materials. As it can retain stability in a desirable catalyst in organic-metal framework, we used tyrosine-rich peptide to not only facilitate its catalytic activity but also maintain a resistance directly connected to reproducibility as support. Herein, we developed a Pd ion-driven peptide nanostructure, newly nano-catalytic system, just by thermal control. As a result, the complex of Pd ion conjugated peptide self-assembled structure was synthesized by interaction of self-assembled peptide and Pd ion. The resulting self-assembled nanostructure was identified by UV-Vis, FT-IR, XRD and XPS. Spherical shape of Pd-complexed nanostructure was confirmed by TEM, SEM analysis. To evaluate this catalytic activity, we applied this Pd@PEP nanostructure for TMB oxidation. Finally, we revealed that feasibility of prepared peptide nanostructure as bioinspired nanocatalyst that can replace any existing redox catalyst.