

Electrochemical Decoration of Glassy Carbon Electrodes
with Amine-Terminated Dendrimers Encapsulating
Nanoparticles for Construction of Bifunctional
Nanostructures

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Here, we report electrochemical modification of glassy carbon electrodes (GCEs) with amine-terminated dendrimers encapsulating nanoparticles (DENs). Amine-terminated DENs, which have uniform small sizes less than 2 nm, were immobilized onto GCEs via electrooxidative grafting. We functionalized the DENs-immobilized GCEs further for construction of bifunctional nanostructures, which conjugate electrocatalytic and biochemical activities. Specifically, as-prepared Pt DENs were immobilized onto GCEs via electrooxidative coupling of the terminal amine groups of dendrimers to the carbon surfaces, and glucose oxidase (GOx) enzymes were subsequently conjugated to the remaining amine groups of the immobilized dendrimers through biotin-streptavidin chemistry. This allowed construction of a unique bifunctional nanostructure combining biologically active GOx and size-monodisperse Pt nanoparticles utilizing only a single dendrimer layer.

References

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