

Ce/SiQDs as pseudo-enzymatic catalase to inhibit H₂O₂ inside the cells of the body

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Catalases, in biological systems, serve as protectors against oxidative damages resulting from hydrogen peroxide [1]. This enzyme transforms millions of hydrogen peroxide molecules into water and oxygen every second [2]. It exhibits the highest concentration in the liver, kidneys, pancreas, and red blood cells [3]. The active site of this enzyme comprises an iron porphyrin. In this study, we utilized the hydrothermal method to synthesize Ce/SiQDs. We investigated the catalytic activity of these Ce/SiQDs in decomposing hydrogen peroxide into water and oxygen. The activity of the Ce/SiQDs was evaluated using UV-visible spectroscopy. Additionally, we employed FE-SEM, DRS, EDS, FT-IR, PL, TGA, CHN, and UV-vis spectroscopy for the identification of the prepared catalase. The results demonstrated that Ce/SiQDs possess the potential to act as synthetic catalase enzymes capable of inhibiting the action of hydrogen peroxide in body cells.

Keywords: Quantum Dots, Catalase Pseudo-Enzyme, Hydrogen Peroxide, Silicon quantum dot

References

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