

Visible light induced electron transfer behavior of a CeO₂-loaded HfO₂/carbon cluster nanocomposite material

ABSTRACT

The microwave-irradiated calcination of HfOCl₂/starch complex I under an air atmosphere produced the HfO₂/carbon cluster composite material which is denoted as Ic. The obtained composite material could decompose methylene blue under the irradiation of light ($\lambda > 460$ nm). The surface of Ic was loaded with CeO₂ particles to obtain CeO₂-loaded composite material, which can decompose the aqueous silver nitrate solution and produce O₂ and Ag in the ratio of 1:4.2. Water photo-decomposition experiment was also carried out using Pt-modified composite materials.

Keyword: Semiconductors; Polymers; Nanostructures; Inorganic compounds; Electronic structure