

Preparation of TiO₂ photocatalyst using peptide-bound polymer bead

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Titanium dioxide has been widely investigated as a photocatalyst for the degradation of organic pollutants. TiO₂ particle can be structured as nanotubes, nanowires or nanoparticles, and recent attention has been focused on hollow sphere structures. The specific sequence of peptide, oligomer of amino acids, was reported to have a binding affinity to specific target component. By using biopanning protocol, various peptide sequences (i.e. HKKPSKS) with affinity to metal oxide like TiO₂ was found previously. In the present work, the hydrophobic peptide sequence (LLLLLLL-HKKPSKS) including the 7-mer of peptide sequence known to TiO₂ binding affinity was first bound to polystyrene bead. Then the peptide-bound polymer bead was applied for the synthesis of TiO₂ particle. We immobilized the whole 14-mer peptide onto the surface of polymer bead. Various experimental condition was optimized to efficiently synthesize TiO₂ particle starting from TiBALDH precursor.