

OP 08
Surface modification of nano-TiO₂ with para-aminobenzoic acid in supercritical carbon dioxide for preventing aggregation of nanoparticles
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Abstract (less than 300 words)
<p>Post-modification amino acid modified titanium dioxide (TiO₂) nanoparticles syntheses were performed by the supercritical CO₂ method to prevent the aggregation of TiO₂ nanoparticles in the solvent systems. The results showed that the modification rate of TiO₂ nanoparticles with para-aminobenzoic acid (PABA) obtained by the supercritical carbon dioxide method was 2.24 times higher than the conventional solvent immersion method. From the results of FT-IR analysis and supported by TG-DTA, TEM, and elemental analysis, it can be concluded that the binding form of PABA molecules on the surface of TiO₂ nanoparticles produced through the chemically bridging reaction. XPS analysis confirmed that the carboxylate group is bound onto the TiO₂ surface and freely lets the amine group. The surface modification by PABA influenced the surface electrical property of TiO₂ nanoparticles to a positive charge and showed better dispersibility in water and alcohol compared to unmodified TiO₂ nanoparticles. A Supercritical CO₂ method is an environmentally friendly method and effectively be applied in the surface modification of nanomaterials.</p>
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