

LIGHT SENSITIVE COMPOSITE MICROSPHERES AND CLEAN ENERGY APPLICATIONS

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ABSTRACT

The core shell materials containing titania can improve the properties of the core including chemical, magnetic and optical properties. Moreover, composite microspheres may exhibit novel properties that are not found in a single oxide. Recently, it was reported that SiO₂/TiO₂ composite particles exhibited better photocatalytic properties than the classical oxides such as titania and silica. Synthesis of mesoporous materials with a regular geometry and using as a durable heterogeneous photocatalyst has become popular in recent years due to catalyze these materials, adsorption, separating the medical field and availability, from nanotechnology. Such microparticles without need a lot of energy plays a major role in the removal of environmental pollutants. Ultrafiltration removal of such contaminants, electrochemical treatment, adsorption although there are some techniques, such as pollution comprises a second due to the materials used in these methods are now lost its importance.

In this study, sol-emulsion-gel methods, microparticles of the desired size were synthesized. Monodispersed SiO₂ microporous microspheres were synthesized by a modifying stöber method. The results showed that composite particles were about 0.5 µm in diameter, and had a spherical morphology and a narrow size distribution.

The core shell particles were characterised by various techniques as FTIR, XRD, FESEM, and their photocatalytic activity for the decomposition of methylene blue (MB) in water.

The optimum conditions for the synthesis of particles, mixing speed and duration of calcination temperature, organic solvents, surface active agents, biomaterials, starting materials was taken into consideration differences in concentration by changing the particle size of these parameters, the effect was followed photoactivity. Experiments carried out with micro-size particles can be controlled to be synthesized. The degradation effect of model pollutant (MO) was determined using UV/Vis spectrophotometry. The amount of surfactant used in the particle size resulted in a decrease after a certain point. However the areas of use of materials obtained from the tests carried out in the laboratory for expanding the applicability of data to reveal the industrial field were studied. The result of this study shows the potential of applying new generations of catalyst for wastewater purification. Simplicity, low cost, low energy consumption, and solvent-free are the advantages of this proposed method which can be used to photodecompose environmental organic pollutants effectively without heat treatment.