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Visible light driven photo-active nano Ag-TiO₂ for coating applicationsJ L Cheng¹, Y L Seow¹, B S A Sharifah Fatanah¹, H Miao¹, B K Tay¹ and K Loke²¹Temasek Polytechnic, Singapore²Singapore Technologies Kinetics Ltd., Singapore

In recent times, the use of TiO₂ for photo catalytic purposes has attracted much attention. This is mainly due to TiO₂ having many advantages over other photo catalysts. It has been proven to be nontoxic, biologically inert, physically and chemically stable against corrosion. Nevertheless, some characteristics limit the practical application of TiO₂. TiO₂ is known to exhibit photocatalytic properties only in the presence of UV light radiation. These limit the applications of TiO₂ as coating materials since the sunlight only consists of 3% to 5% UV light. Visible light driven photo catalytic nano Ag-TiO₂ was successfully synthesized using a low temperature, facile electro less deposition technique. Various wt% of nano Ag was deposited onto commercial Degussa P25 TiO₂ nanopowders. The photo catalytic effect of the synthesized powders was studied using the UV-Vis spectrometer on the degradation profile of methylene blue (MB). Contact angle measurement was also done on Ag-TiO₂ coated steel plate to evaluate its hydrophilicity/self-cleaning effect. The results showed significant improvements in MB degradation under visible light compared to commercial TiO₂ nano powders. The amount of deposited Ag on TiO₂ (1-10wt %) was also found to have negligible effects on its degradation profile. Super hydrophilicity (self-cleaning) effects were also observed for the coated surface compared to non-coated surface.

Biography

J L Cheng completed his PhD in Materials Science and Engineering from Nanyang Technological University, Singapore and was awarded with the Ian Fergusson Fellowship at the Georgia Institute of Technology, USA. His expertise includes synthesis and characterization of nano materials for coating, thermal insulation and grease absorption applications. He is currently a Lecturer and Principal Investigator of several government agencies funded projects at the Temasek Polytechnic, Singapore.

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