

Investigation of Nano-Colorant Master Batch

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ABSTRACT

The encapsulation of organic pigment (a copper phthalocyanine blue pigment) with polymer by co-sonication of copper phthalocyanine blue pigment dispersion and a typical miniemulsion polymerization was studied. The pigment containing polymer particles were analyzed in detail by particle size measurements, transmission electron microscopy, UV-Vis spectrophotometry and thermogravimetric analysis. The effect of the polymerization process and type of surfactant and co-surfactant in the efficiency of encapsulation were investigated. The pigment was first suspended into surfactant by sonication, before being encapsulated by miniemulsion polymerization using styrene as monomer and water soluble potassium persulfate as initiator. The final particle size was in the range of 67 to 157 nm. Dynamic light scattering measurements showed that the organic pigment could stabilize the miniemulsion droplets, and be thus satisfactorily encapsulated without introducing any other compound in the formulation.

Key words: Encapsulation, Organic pigment, Miniemulsion, Polymerization

INTRODUCTION

Organic pigments have been extensively used in coating, ink and lastic industries or even in color filters for electronics and communication apparatus since they have many advantages such as photosensitivity, color strength, excellent transparence and etc. However, the limited hiding powder, poor dispersion ability, and especially the poor weather are obviously the obstacles for organic pigments in other applications (Marim et al., 2005). The current status to make a color resin or polymer was adopted by using processes after finished the polymerization that are dispersing, compounding, or using mixing equipments like twin screw, kneader and three roller to induce the color inside the polymer. After that the colorful polymer will be obtained, then using to different application. Since the process treat the different phase, solid disperse into the melt viscous liquid phase. The man force to disperse the color particle is not easy to attach boundary of the very small size one. Normally the size, can be treated around 1-5 micron, so the color will show the strong scatter effect, and the lower saturation. There are numbers of method explored so far attempting to address these problems. In real