

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Shear Rate Dependent Structure of Polymer Stabilized TiO₂ Dispersions - 1. TiO₂ Structure ALAN NAKATANI, Rohm and Haas Company, ANTONY VANDYK, LIONEL PORCAR, NIST, JOHN BARKER — We measured the shear rate dependent structure of TiO₂ dispersions (37% volume fraction) stabilized with commercial polymer dispersants in water. The TiO₂ is a commercial grade TiO₂ with a particle diameter of approximately 400 nm (when the dispersions were diluted and measured by Nanotracer 150). The solvent compositions were adjusted to the contrast match point of each dispersant to isolate the behavior of the TiO₂. Two different molecular weight poly acid dispersants (Referred to as “low MW acrylate polymer salt” and “high MW acrylate polymer salt”) and two different molecular weight alkali soluble acrylate copolymers (Referred to as “low MW hydrophobic acrylate copolymer salt” and “high MW hydrophobic acrylate copolymer salt”) were used in this study. The experiments were conducted at the NIST Center for Neutron Research (NCNR) on the perfect crystal diffractometer (PCD) for ultra-high resolution small-angle neutron scattering (USANS) measurements. The results for the TiO₂ scattering show that shear induced agglomeration occurs for certain dispersants and shear induced breakup of TiO₂ aggregates is observed for other dispersants. The results suggest new ways to consider dispersion of particles.

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Date submitted: 13 Dec 2005

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