

Nanoparticle Surface Treatments – Application Tailored Interfaces

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ABSTRACT

Nanophase Technologies Corporation has developed new surface treatment technologies for nanoparticles. The new surface treatments may be applied to a wide range of nanoparticle types and chemistries and enable the nanoparticle interface to be tailored to meet targeted market applications.

Keywords: nanoparticle, surface treatment

1 INTRODUCTION

Nanophase Technologies Corporation (NTC) is an advanced materials company that develops nanomaterial solutions for targeted applications. NTC manufactures nanoparticles, surface-treated nanoparticles, and dispersions employing an integrated platform of commercial scaled technologies.

2 SURFACE TREATMENTS

NTC has several global partnerships to reach the market – BASF for sunscreens and personal care ingredients, Rohm & Haas for CMP polishing, and BYK-Chemie for additives for coatings and plastics. NTC surface treatments may be applied to a wide range of nanoparticle types and chemistries and enable the nanoparticle interface to be tailored to meet targeted market applications. These surface treatments were developed in response to specific market needs and the first products employing this technology has been launched by Nanophase's partners.

3 MARKET APPLICATIONS

Three application areas will be discussed: polymer additives, CMP and glass polishing, and personal care. Once application feasibility is demonstrated these processes are typically scaled to supply commercial products within 3 months.

Commercial polymer additive products for UV-cured coatings will be described. These products are dispersions of either alumina or zinc oxide nanoparticles in acrylate monomers.

Commercial polishing products for CMP and glass polishing will be described. These products are dispersions of either alumina or ceria nanoparticles in water at either acidic or basic pH.

Commercial personal care products for sunscreen and daily wear will be described. These products are surface treated zinc oxide particles with a range of hydrophobic properties.

Commercial produces from the process will be described with specific attention given to differentiating characteristics which enable targeted applications.