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Zirconium oxide nanoparticles help dental fillings harden quickly, add strength

By Rosemary Clandos

Altair Nanotechnologies (NASDAQ:ALTI) has launched a zirconium oxide dental material that will allow fillings to harden more quickly. The Reno, NV-based company will leverage its patented technology for making nanocrystalline metal oxide particles to offer dental supply companies economically priced materials.

Zirconium oxide will eliminate problems associated with slow-hardening polymers used for fillings. Often people eat too soon after a polymer filling has been inserted, causing fillings to distort or fall out. The material also will give extra strength to polymers and will not have an abrasive effect.

Unlike micron-sized particles, the zirconium oxide nanoparticles are transparent to visual light and absorb ultra violet light. When they are used in polymer compounds and light is directed on them, the nanoparticles transfer energy from the light source to the polymers, causing fillings to harden within minutes. The material becomes opaque and it can be tinted to match the color of patients' teeth.

Although there are zirconium oxide-based nano-sized materials on the market, Altair's president, Rudi Moerck, claims their products offer excellent size uniformity and purity. They can be customized for different polymers used by dental companies, and the rate of polymerization, or hardening, can be controlled by particle size and shape. Dental companies will be able to make products that work well with their polymer systems, he says.

Agglomeration rate is another important element of Altair's product. In the manufacturing process, nanoparticles often agglomerate or stick together like grape clusters. Certain manufacturing methods create high and low agglomerations. Most nanomaterials are agglomerated when they are dry, but when they are disbursed in polymer bases, the agglomeration changes. If the agglomeration level is low, the particles are generally more efficient. "Our products have low agglomeration levels and are relatively easy to disburse," says Moerck.

"There's a lot of hype about nanomaterials now. You can make nanoparticles in four or five different ways and you end up with pretty much the same thing. In the long run, some will be economical and some won't. We think we have the most efficient and cost effective process for making these materials. There could be a savings in the 40% range," says Moerck.

"The problem they are trying to solve is a significant one and the dental products companies would welcome the opportunity to have the kind of cost savings and performance improvements that Altair believes they will be able to deliver," says Peter Young, president of Young & Partners, an investment banking company.

A major research institution is using Altair's materials to generate formulations for dental supply companies, says Moerck. Dentists may be able to purchase ready-made compounds in about three months. Using the product to make dental prostheses is a long way off because the costs for product testing and entering the market are high.

Altair is now looking for partnerships and talking with several dental materials companies. They're also having discussions with private investors and people in private and equity funding companies.

Altair's stock has increased from a low of $0.30 per share range to close at $1.20 on Sept. 30.

Moerck says his company has about $1 million cash on hand to get them through the end of the year.

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