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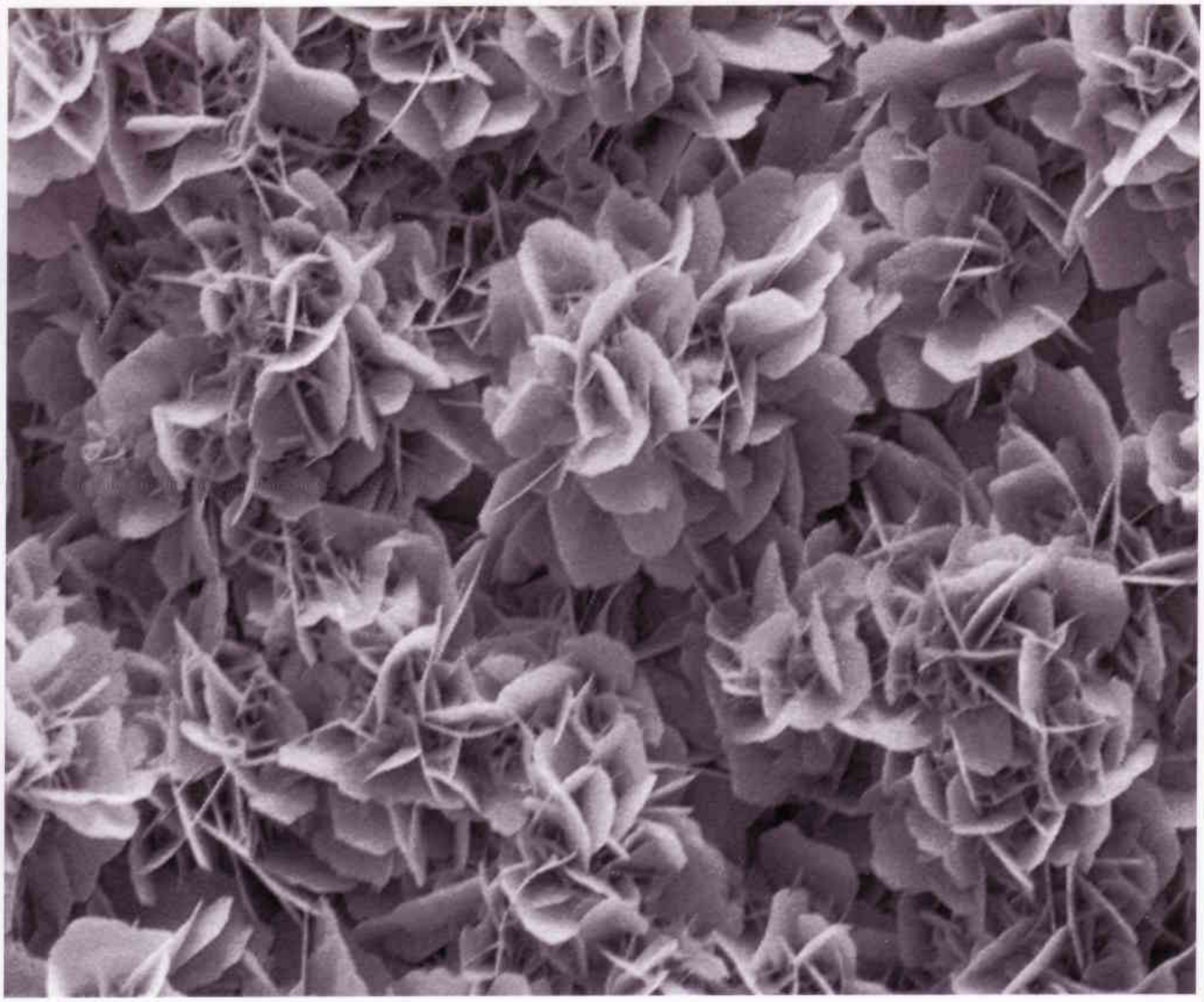

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Editorial queries to be sent to Angela DePina, Journal of Materials Science: Materials in Medicine
Springer
101 Philip Drive, Norwell, MA 02061 USA
Angela.Depina@springer-sbm.com • Telephone: (781) 871-6600

Cover photograph: SEM micrographs of pristine and CDHA-converted surfaces of marble cubes soaked in Na-K-phosphate solution at 60 °C for 3 days: marble cube (60 °C, in PS for 3d). (See paper by Tas *et al.*, page 167.)

Editors of the "Journal of Materials Science: Materials in Medicine" selected one of the scanning electron microscope photomicrographs of **Dr. A. Cuneyt Tas** (in an article co-authored by Dr. Fritz Aldinger, *J. Mater. Sci: Mater. Med.*, **16**(2), 167-174, 2005) as the cover image for their February 2005 issue.

Dr. A. C. Tas of Clemson University (since May 2003), School of Materials Science and Engineering has developed (*when he was a Visiting Professor at Max-Planck-Institut fuer Metallforschung, Stuttgart, Germany between Feb 1999 – Feb 2001*) a single powder, self-setting orthopedic calcium phosphate cement. This special cement uses an aqueous solution of tri-Na-citrate and tri-Na-phosphate salts as its setting solution.

The setting product of this cement is extremely close in chemistry and physical composition to the human bone mineral (i.e., carbonated, calcium-deficient, apatitic calcium phosphate). Such cements will be used as bone substitutes to repair bone (as well as dental) defects, which may originate from cysts, trauma, sports-traffic injuries, and war casualties.

In his approach to synthesize the powder component of a new self-setting orthopedic cement, Dr. Tas used a simple inorganic aqueous solution with a pH equal to that of human blood, i,e., 7.4. His simple and inexpensive solution is prepared by dissolving appropriate amounts of water soluble salts of KH_2PO_4 and Na_2HPO_4 in deionized water. He then performed the powder synthesis procedure in this solution at 37°C. Commercially available calcium phosphate-based cements used by the orthopedic surgeons (e.g., Calcibon®, Norian SRS®, α-BSM®, Biopex®, etc.) comprise physical mixtures of more than one powder in their powder components, and this study showed, for the first time, that single-phase calcium phosphate powders can also be used as orthopedic cements.

In the second part of his aforementioned study, Dr. Tas employed the same Na- and K-phosphate solution to convert 1 x 1 x 1 cm cubes of naturally-occurring Stuttgart marble (i.e., $CaCO_3$) into the "bone mineral" at 60°C. The photomicrograph selected as the cover image showed the surface of a marble cube after this treatment, being converted into the characteristic nanoneedles or nanoplatelets of bone mineral, without losing its physical shape, strength, and integrity during this process.

Such mechanically strong and truly biomimetic materials can be used, for instance, as dental implants. Currently, almost all the root implants used in dentistry are made out of strong but totally bioinert ceramics, such as Al_2O_3. The advantages of providing dentists and surgeons with strong and "biomimetic, bioactive" (*such as calcium phosphates*) implant materials are obvious.