

A. Cuneys Tas, Ph.D.

1993: PhD in Ceramic Engineering (Iowa State, USA)
06/'93-11/'97: Assistant Professor (METU, Turkey)
11/'97-01/'02: Associate Professor (METU)
02/'99-02/'01: Visiting Professor (Max-Planck-Institut)
09/'01-04/'03: Senior Staff Scientist (Merck, Germany)
05/'03-04/'06: Research Prof. (Clemson Univ., USA)
05/'06-11/'06: Professor (Mersin University, Turkey)
11/'06-9/'10: Professor (Yeditepe University, Turkey)
08/'07-06/'08: Visiting Prof. (New York Univ, USA)
9/'10-9/'11: Visiting Prof. (Univ. of Oklahoma, USA)
4/'12-6/'15: Res. Scholar (Univ. of Illinois, USA)
7/'15-to date: Principal Scientist (Solidia Techno., USA)

Publications

Peer-reviewed publications:	71
Google Scholar citations:	5000
h-index: 35	i10-index: 65
Symposium presentations:	126
Book chapters:	34
ICDD X-ray diffraction patterns:	18
Phase diagrams:	2

Patents

US Patents: 4	PCT Patents: 2
European Patents: 4	Canadian Patents: 2
German Patents: 2	French Patent: 1
British Patents: 2	Turkish Patents: 9

Product-on-the-market

“*Calcibon[®] Granules*”: Micro- and macro-porous apatitic, bone-like calcium phosphate spherical granules (1 to 6 mm in diameter) used for the clinical repair of bone defects since 2003. These have been the first porous granules ever produced “at room temperature by using a self-setting, orthopedic cement material.” Granules were made by Dr. Tas at Merck Biomaterials GmbH in Darmstadt, and are currently marketed by Biomet Europe. See: http://www.cuneyttas.com/Calcibon-GPS_2_protocol.pdf, US Patent 7,381,262 and J. Mater. Sci. Mater. Med., 19(5), 2231-2239 (2008).

Awards / Honors

- Elected, Member/ International Centre for Diffraction Data (since May 1997)
- Faculty Excellence in Teaching Awards (METU), 1993, 1999, and 2000 (3000 USD each + certificate)
- Max-Planck-Society Scholarship (Feb1999-Feb2001)

Student Advising

- 12 graduate theses supervised & completed (5 in METU-Turkey, 5 in Clemson Univ.-USA, 2 in Max-Planck-Institut / Germany),
- >50 undergrads were assigned research projects

Contributions to Inorganic Materials Science

1.) Urea decomposition, catalyzed by its enzyme urease, is a regulated (in terms of supply) source of HCO₃⁻ ions in synthesis solutions. This method was demonstrated to produce Y(Cr, Co)O₃, LaAlO₃,

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Pb(Zr_{0.52}Ti_{0.48})O₃, Gd-doped CaZrO₃, Sr- and Zn-doped LaGaO₃, GaO(OH), Mn-doped ZnGa₂O₄ (Patent No: EP 1 227 139), CaCO₃, and “biomimetic” calcium phosphates.

2.) Synthetic body fluids (SBF), mimicking the blood plasma in terms of ion concentrations, can *in situ* form nanosize calcium phosphate (CaP) particles. Author has developed a Tris-buffered SBF solution back in 1997 (published in 1999, J. Eur. Ceram. Soc.) with a HCO₃⁻ concentration (i.e., 27 mM) exactly equal to that of human plasma. Developed “10xSBF” solution (J. Mater. Res., 2004) for “coating” bioinert ceramics, polymers, or metals with a CaP layer to make their surfaces more osteoinductive.

3.) Synthesized carbonated nanopowders (in bulk quantities) of calcium phosphates by using an SBF solution (Biomaterials, 2000) and/or enzyme-catalyzed biomimetic synthesis at 37°C (J. Mater. Sci. Lett., 2001)

4.) Used DMEM cell culture solutions, instead of SBF, to test the *in vitro* biocompatibility of CaP biomaterials & Ti (Mater. Sci. Eng. C, 2010 and 2014)

5.) Tris- or Hepes-free SBF solutions by using Na-lactate and lactic acid pair (Lac-SBF) (Pasinli et al., Acta Biomater., 2010 and 2012)

6.) Biphasic CaP synthesis (J. Am. Ceram. Soc., 1998)

7.) Hydroxyapatite powders of high thermal stability (Biomaterials, 2000), which did not decompose to β-TCP even at 1500°C

8.) Three different methods of synthesizing whiskers (i.e., single crystals) of calcium phosphate (either β-TCP or HA) biomaterials at <100°C or 1200°C (J. Am. Ceram. Soc., 2001 & 2007 and J. Mater. Res., 2004)

9.) Various self-setting cements for bone defect repair: [1] J. Mater. Sci. Mater. M., 16, 167-74 (2005), [2] Patent No's: US 6,929,692 & US 7,381,262 [3] Int. J. Appl. Ceram. Tech., 4, 152-163 (2007)

10.) First monetite (CaHPO₄) cement (2005)

11.) “Biconvex micropills” of CaCO₃. Such micropills, in any material system, were not possible before this work (US Patent No: 8,470,280)

12.) Rhenanite (NaCaPO₄)-apatite biphasics

13.) “Dumbbell-shaped” brushite (CaHPO₄·2H₂O) crystals (2010) and brushite micro-granules (2012)

14.) “Calcium metal” to synthesize amorphous calcium phosphate (2012) US patent 9,108,860 (2015)

15.) Amorphous calcium phosphate (ACP) nanospheres formed in DMEM-like (2013) or synthetic body fluid (Lac-SBF) solutions (2014)

16.) Nano-CaP of 900 m²/g BET surface area (2014)

17.) Aragonite is reactive in Lac-SBF solutions (2014)

18.) Novel “aragonite coating solutions” (ACS) (2015)

19.) Whitlockite synthesis from brushite (2016)