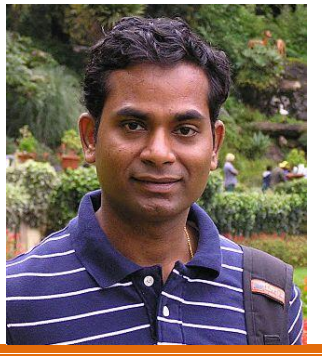
Dr. Atul Suresh Deshpande



Assistant Professor

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Objective

Run an independent research group focused on nanostructured materials for advanced applications

Education

- **Ph.D :** 2001-2004, International Max Planck Research school (IMPRS) on Biomimetic Systems, Max Planck Institute of Colloids and interfaces, Potsdam, Germany.

Thesis title: Fabrication of porous metal oxides for catalytic applications using templating techniques

- **M.Sc. (Inorganic Chemistry):** 1997- 1999: Department of Chemistry, University of Pune, India

- **B.Sc. (Chemistry)** 1994- 1997 Sir Parashurambhau College, Pune, India.

Research skills

Extensive experience in handling of transmission electron microscope (TEM) (more than 500 hours of instrument usage along with expertise in instrument alignment and maintenance). Well versed with biochemical techniques such as SDS-PAGE gel chromatography and cell culture techniques and collagen purification. Hands on experience in analytical techniques such as scanning electron microscopy (SEM), X-ray powder diffraction (XRD), small angle x-ray scattering (SAXS), BET surface area measurements, infra-red (IR) spectrometry and thermogravimetry (TGA/DSC)

Professional positions

2011- onwards: Assistant Professor at Materials Science and Engineering Department, Indian Institute of Technology Hyderabad, Hyderabad, India

2006- 2011: Postdoctoral Fellow at the Forsyth Institute, Boston, US, till August 2007. Continued the same position at the School of Dental Medicine, University of Pittsburgh, Pittsburgh, US.

2004- 2006: Postdoctoral fellow at the Department of Biomaterials, Max Planck Institute of Colloids and interfaces, Potsdam, Germany.

1999-2001: Project assistant, the Physical and Materials Chemistry Division, National Chemical Laboratory, Pune.

Fellowships & Distinction

Ph. D studentship of International Max Planck Research School (IMPRS) on Biomimetic Systems: Oct 2001- June 2004

Passed National Eligibility Test (NET) for Lecturership**,** by Council of Scientific and Industrial Research, Government of India: June 2000

Research Interests

Nanoparticle synthesis and assembly: Synthesis of nanoparticles with controlled size/shape and their assembly processes.

Porous Materials: Generation of nanoporous materials for advanced material applications

Biomaterials: Biomimetic approaches for the generation of materials for tooth/bone tissue repair and drug delivery applications

List of Publications and Patents

Total number of Publications: 19

Total number of citations (until Jan 2012): 475 (source: Scopus)

Average citations per article: 25

h-index: 13

1.”Primary structure and phosphorylation of dentin matrix protein 1 (DMP1) and dentin phosphophoryn (DPP) uniquely determine their role in biomineralization”
Deshpande A.S., Fang P. A., Zhang X., Jayaraman T., Sfeir C., and Beniash E.
Biomacromolecules 12(8), 2933–2945(2011)

2. “Possible role of DMP1 in dentin mineralization”
Beniash E., **Deshpande A. S.**, Fang P.A., Lieb N. S., Zang X, Sfeir C. S.
Journal of Structural Biology 174 (1), 100-106 (2011).

3. “Amelogenin-Collagen Interactions Regulate Calcium Phosphate Mineralization”
Deshpande A. S., Fang P. A., Simmer J. P., Margolis H. C., Beniash E.
Journal of Biological Chemistry. 285, 19277-19287 (2010)

4. “Bioinspired synthesis of mineralized collagen fibrils”
Deshpande A. S., Beniash E.
Crystal Growth & Design. 8 (8), 3084-3090 (2008) **(Cover Article)**

5. **“**Synthesis of mesoporous ceria zirconia beads”
Deshpande, A. S., Niederberger, M.
Microporous and mesoporous materials 101 (3), 413-418 (2007)

6. Atomic-scale structure of nanocrystalline CeO2-ZrO2 oxides by total x-ray diffraction and pair distribution function analysis
Gateshki, M., Niederberger, M.,**Deshpande, A. S.**, Ren, Y., Petkov V
Journal of Physics: Condensed Matter 19 (15), 156205 (2007)

7. "Hierarchically structured ceramics by high-precision nanoparticle casting of wood"
Deshpande, A. S., Burgert I., Paris O.
Small 2 (8-9), 994-998 (2006)

8. "Steam reforming of methanol over Cu/ZrO2/CeO2 catalysts: a kinetic study"
Mastalir, A., Frank, B., Szizybalski, A., Soerijanto, H., **Deshpande, A.**, Niederberger, M., Schomäcker, R., Schlögl, R., Ressler T.
Journal of Catalysis 230, 473–484 (2005)

9."Titania and mixed titania/aluminum, gallium or indium oxide spheres: Sol-gel/template synthesis and photocatalytic properties".
Deshpande, A. S., Shchukin, D. G., Ustinovich, E., Antonietti, M. and Caruso, R. A. **Advanced Functional Materials 15(2)**, 239-245 (2005)

10."Controlled assembly of preformed ceria nanocrystals into highly ordered 3D nanostructures"
Deshpande, A. S., Pinna, N., Smarsly, B., Antonietti, M., Niederberger M.
Small 1(3), 313-316 (2005)

11."Synthesis and characterization of stable and crystalline CexZr1-xO2 nanoparticle sols".
Deshpande, A. S., Pinna, N., Beato, P., Antonietti, M. and Niederberger, M.
Chemistry of Materials. 16 (13), 2599 -2604 (2004)

12."Synthesis of nanosized Ce0.75Zr0.25O2 porous powders via an autoignition: glycine nitrate process"
Potdar, H. S., Deshpande, S. B., Khollam, Y. B., **Deshpande, A. S.**, and Date, S. K.
Materials Letters. **57**, 1066-1071 (2003)

13."Preparation of ceria-zirconia (Ce0.75Zr0.25O2) powders by microwave-hydrothermal (MH) route" .Potdar, H. S., Deshpande, S. B., **Deshpande, A. S.**, Gokhale, S. P., Date, S. K., Khollam, Y. B. and Patil, A. J.
Materials Chemistry and Physics. 74, 306-312 (2002)

14."A self-sustaining acid-base reaction in semi-aqueous media for synthesis of barium titanyl oxalate leading to BaTiO3 powders".
Khollam, Y. B., **Deshpande, A. S.**, Potdar, H. S., Deshpande, S. B., Date, S. K. and Patil, A. J.
Materials Letters. **55**, 175-181 (2002)

15."Simplified chemical route for the synthesis of barium titanyl oxalate (BTO)".
Potdar, H. S., Deshpande, S. B., **Deshpande, A. S.**, Khollam, Y. B., Patil, A. J., Pradhan, S. D. and Date, S. K.
International Journal of Inorganic Materials. 3, 613-623 (2001)

16."Microwave-hydrothermal synthesis of equi-axed and submicron-sized BaTiO3 powders".
Khollam, Y. B., **Deshpande, A. S.**, Patil, A. J., Potdar, H. S., Deshpande, S. B. and Date, S. K.
Materials Chemistry and Physics. 71, 304-308 (2001)

17."Synthesis of yttria stabilized cubic zirconia (YSZ) powders by microwave-hydrothermal route".
Khollam, Y. B., **Deshpande, A. S**., Patil, A. J., Potdar, H. S., Deshpande, S. B. and Date, S. K.
Materials Chemistry and Physics. 71, 235-241 (2001)

18"Improved chemical route for quantitative precipitation of lead zirconyl oxalate (PZO) leading to lead zirconate (PZ) powders".
Deshpande, A. S., Khollam, Y. B., Patil, A. J., Deshpande, S. B., Potdar, H. S. and Date, S. K.
Materials Letters. 51, 161-171 (2001)

19."Preparation and characterization of strontium zirconate (SrZrO3) fine powders".
Potdar, H. S., Deshpande, S. B., Patil, A. J., **Deshpande, A. S**., Khollam, Y. B. and Date, S. K.
Materials Chemistry and Physics. 65, 178-185 (2000)

Patent:

1. An improved process for the preparation of barium titanyl oxalate (BTO).
Potdar, H.S., Desphande, S.B., Date, S.K., Khollam**,** Y.B., **Deshpande**, **A.S.,** Patil, A.J.,
Indian Pat. Appl. (2007), IN 2001DE00792 A 20071123.

Talks and Posters

8. *Influence of amino acid sequence and phosphorylation on functional role of Non- Collagenous proteins in biomineralization*
Poster presented at International Conference on the Chemistry and Biology of Mineralized Tissues(ICCBMT), Scottsdale- Arizona, USA. November 2010

7. *Role of Dentin Proteins' Primary Structure and Phosphorylation in Mineralization* Poster presented at American Association for Dental Research (AADR) Annual meeting, Washington DC. USA, March 2010

6. *Synthesis of Nano-structured Functional Materials by Templating Techniques.* Talk at, Indian Institutes of Science Education and Research, Trivandrum (IISER-TVM), December 2009

5. *Bio-inspired Synthesis of Mineralized Collagen Fibrils.* Poster presented at Gordon Research Conference on Biomineralization, New London, USA. August 2008

4. *Bio-inspired Synthesis of Mineralized Collagen Fibril, the Basic Building Block of Bone and Dentin.* Invited talk at, University of Pittsburgh Postdoctoral Association (UPPDA) talk series, University of Pittsburgh, Pittsburgh, USA. May 2008

3. *Synthesis of Nano-structured Functional Materials by Templating Techniques.* Talk at, Tata Institute of Fundamental Research (TIFR) Mumbai, India. January 2008

2. *Fabrication of porous metal oxides for catalytic applications using templating techniques*. Talk at Chemical Engineering Division National Chemical Laboratory, Pune, India. September 2004.

1.*Polymer Beads Templating*. Talk and poster presented in front of committee for evaluation of International Max Planck Research School (IMPRS) on Biomimetic Systems.