

Purnendu Parhi
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ACADEMIC PROFILE

Ph.D. Chemistry and Biomedical Engineering (2008)

Indian Institute of Technology (IIT), Delhi, India.

Topic: "Studies on Biologically Active Phosphates and related compounds"

M.Sc. Chemistry (1999-2001) 7.2/10 CGPA

Indian Institute of Technology Delhi, India

Topic: "Carbohydrate Based Approach to Polycyclic System"

B.Sc. Chemistry (Honors) (1996-1999) 70%

Delhi University, India

PROFESSIONAL EXPERIENCE:

04/10 – Continue: Lecturer in Chemistry, Ravenshaw University, Cuttack, Orissa

03/08 – 04/10: Postdoctoral fellow, Pennsylvania State University, PA, USA

Project: Surface Science

- Physical chemistry of protein adsorption
- Self assembly monolayer
- Adsorption competition among various proteins for same surface

03/07 –02/08: Postdoctoral fellow at Colorado State University, Fortcollins, CO, USA

Project: Inorganic Synthesis

- Metathesis synthesis of various inorganic materials.
- Use of microwave, microwave-hydrothermal technique for synthesis of technologically important materials in economical way.

01/02-01/07: Research fellow at Indian Institute of Technology Delhi, India

Project: Studies on Biologically Active Phosphates and related compounds

- Synthesis of biologically active calcium phosphate: Specially Hydroxyapatite
- In situ crystal growth
- Synthesis of hydroxyapatite based composite with natural polymer and synthetic polymer
- Systematic studies of the synthesized composite and study of their relation to natural bone

Research Interest:

Surface Chemistry, Materials Synthesis, Protein Adsorption

- Kinetics and Thermodynamics of Protein adsorption.
- Nanoparticle synthesis.
- Solid state synthesis
- Polymer synthesis and characterization
- Synthesis of biocomposites

Technical Skills:

- Cell culture, cell attachment studies.
- Biological Techniques: Bioreactor, Hemocytometer for cell counting, autoclave, Gel electrophoresis, Microplate reader, Ultra-Violet Spectrophotometer, Centrifuge, Shaking Incubators
- Surface science: Kinetic and thermodynamic studies of protein adsorption on different hydrophobic surfaces.
- Synthetic techniques for growth of inorganic compound with regulated size and morphology.
- Bulk and solution polymerization for the synthesis of poly caprolactone using vanadate and molybdate as catalyst.
- Synthesis of hydroxyapatite composite with natural and synthetic biodegradable polymer.
- Powder X-ray diffraction as a tool for characterization of large number of inorganic solids.
- Analytical Techniques: TGA, DTA & DSC (Perkin Elmer), FT-Infra Red Spectrophotometer, Particle size analyzer, contact angle measurement, Scanning electron microscopy, Transmission electron microscopy.
- Communication and presentation skills; participate in writing proposals.

Publications and Presentations:

Research Publications in Reviewed Journals

1. **P. Parhi**, S. Upreti and A. Ramanan, *Crystallization of Calcium Vanadate Solids from Solution: A Metathetic Route*, **Cryst Growth Des.** **2010**, 10, 5078. (**Impact factor 4.16**)
2. P. Kao, **P. Parhi**, A. Krishnan, H. Noh, W. Haider, T. Srinivas, D.L. Allara, E.A. Vogler, *Volumetric Interpretation of Protein Adsorption: Interfacial Packing of Protein adsorbed to Hydrophobic Surfaces from Surface- Saturating Solution Concentrations*, **Biomaterial**, **2011**, 32, 969. (**Impact Factor 6.646**).
3. **P. Parhi**, A. Golas and E. A. Vogler, *Proteins, Water, and the Initial Attachment of Mammalian Cells to Biomedical Surfaces: A Review*, **J Adh. Sci. Tech**, **2010**, 24, 853.
4. L. Wei, **P. Parhi**, E. A. Vogler, T. M. Ritty and A. Lakhtakia *Thickness-controlled hydrophobicity of fibrous Parylene-C films*, **Mater. Lett.** **2010**, 64, 1063. (**Impact Factor 1.748**)
5. A.Golas, **P. Parhi**, Z.O. Dimachkie, C.A. Siedlecki and E. A. Vogler, *Surface Energy Dependence Contact Activation of Blood Factor XII*, **Biomaterials** **2010**, 31, 1038. (**Impact Factor 6.646**)
6. **P. Parhi**, A. Golas, N. Barnthip, H. Noh and E. A. Vogler *Volumetric Interpretation of Protein Adsorption: Capacity Scaling with Adsorbate Molecular Weight and Adsorbent Surface Energy*, **Biomaterials** **2009**, 30, 6814. (**Impact Factor 6.646**)
7. Naris Barnthip, **P. Parhi**, A.Golas and E. A. Vogler, *Volumetric Interpretation of Protein Adsorption: Kinetics of Protein-Adsorption Competition from Binary Solution*, **Biomaterials** **2009**, 30, 6495. (**Impact Factor 6.646**)
8. **P. Parhi** and V. Manivannan *Novel Microwave Mediated Synthesis of Zn_2SiO_4 and $MCrO_4$ ($M = Ca, Sr, Ba, Pb$)* **J. Alloys and Compounds** **2009**, 469, 558. (**Impact Factor 1.510**)
9. **P. Parhi**, V. Manivannan, Sandeep Kohli and Patrick McCurdy *Synthesis and Characterization of $M_3V_2O_8$ ($M = Ca, Sr, Ba$) by solid state metathesis approach* **Bulletin Mater. Sci.** **2008**, 31, 885. (**Impact Factor 0.858**)
10. **P. Parhi**, Jon Kramer and V. Manivannan *Synthesis and Characterization of zirconium diphosphate by Microwave mediated Metathesis Approach* **Mater. Sci. Eng B** **2008**, 153, 53. (**Impact Factor 1.577**)
11. **P. Parhi** and V. Manivannan, *Novel Solution Phase Metathetic Pathway for the Synthesis of $MnV_2O_6 \cdot H_2O$* **Mater Res. Bull.** **2008**, 43, 2966. (**Impact Factor 1.812**)
12. **P. Parhi** and V. Manivannan *Novel Microwave Mediated Solid-State Metathesis Synthesis and Characterization of Lanthanide Phosphates and Vanadates, LMO_4 ($L = Y, La$ and $M = V, P$)* **Solid State Science** **2008**, 10, 1012. (**Impact Factor 1.742**)
13. **P. Parhi**, Jon Kramer and V. Manivannan *Microwave Initiated Hydrothermal Synthesis of Nano-sized complex metal fluorides KMF_3 ($M = Zn, Mn, Co$ and Fe)* **J. Mater. Sci.** **2008**, 43, 5540. (**Impact Factor 1.185**)

14. **P. Parhi**, T.N. Karthik, V. Manivannan, *Synthesis and Characterization of Metal Tungstates by Novel Solid State Metathetic Approach* **J. Alloys. And Compounds** **2008**, **465**, 380. (Impact Factor 1.510)
15. **P. Parhi** and V. Manivannan *Novel Microwave Mediated Solid-State Metathesis Synthesis of KMF_3 ($M = Zn, Mn, Mg, Co$)* **Mater. Lett.** **2008**, **62**, 3468. (Impact Factor 1.748)
16. V. Manivannan, **P. Parhi** and John Howard *Novel Mechanochemical Metathetic Synthesis and Characterization of Nano Structure $MnV_2O_6 \cdot XH_2O$ ($X = 2, 4$)* **J. Cryst. Growth** **2008**, **310**, 2793. (Impact Factor 1.757)
17. **P. Parhi**, V. Manivannan, *Microwave Mediated Metathesis Synthesis of Zinc Chromate* **J. European Ceram. Soc.** **2008**, **28**, 1665. (Impact Factor 1.580)
18. **P. Parhi**, V. Manivannan, Sandeep Kohli and Patrick McCurdy *Room temperature metathetic synthesis and characterization of α -hopeite, $Zn_3(PO_4)_2 \cdot 4H_2O$* **Mater. Res. Bull.** **2008**, **43**, 1836. (Impact Factor 1.812)
19. **P. Parhi**, A. Ramanan and A.R. Ray, *Metathetic Reaction in Reverse Micelles: Synthesis of Alkaline Earth Metal Phosphate Nanorods.* **J. Amer. Ceram. Soc.** **2007**, **90**, 1237. (Impact Factor 2.101)
20. **P. Parhi**, A. Ramanan and A.R. Ray, *Nanocrystalline powders of alkaline –earth phosphate as precursors for bioceramics,* **Amer. J. Biochem.& Biotech.** **2006**, **2**(2), 61.
21. **P. Parhi**, A. Ramanan and A.R. Ray, *Synthesis of hydroxyapatite-alginate based biocomposites,* **J. Appl. Poly. Sci.** **2006**, **102**, 5162. (Impact Factor 1.187)
22. **P. Parhi**, S.S. Singh, A. Ramanan and A.R. Ray, *Mechanochemically assisted room temperature solid state metathesis reaction for the synthesis of $MMoO_4$ ($M = Ca, Sr, Ba$),* **Bull. Mater. Sci.** **2006**, **29**(2), 115. (Impact Factor 0.858)
23. **P. Parhi**, A. Ramanan and A.R. Ray, *Hydrothermal Synthesis of Nanocrystalline powder of Alkaline-earth hydroxyapatite $A_{10}(PO_4)_6(OH)_2$ ($A = Ca, Sr, Ba$),* **J. Mate. Sci.** **2006**, **41**(5), 1455. (Impact Factor 1.185)
24. **P. Parhi**, A. Ramanan and A.R. Ray, *Synthesis of Nano-size Alkaline-earth hydroxyapatite through microwave assisted metathesis reactions,* **Mater. Lett.** **2006**, **60**, 218. (Impact Factor 1.748)
25. **P. Parhi**, A. Ramanan and A.R. Ray, *A convenient route for the synthesis of hydroxyapatite through microwave- mediated metathesis reaction,* **Mater. Lett.** **2004**, **58**, 3610. (Impact Factor 1.748)

Papers presented in Conferences (National and International)

1. V. Manivannan, **P. Parhi**, Jon Kramer *Synthesis of Inorganic Materials by Novel Metathesis Approach.* Abstracts, 43rd Midwest Regional Meeting of the American Chemical Society, Kearney, NE, United States, October 8-11 (2008)
2. **P. Parhi** and V. Manivannan *Room temperature solid state metathesis synthesis of hopeite phase.* Abstracts, 20th Rocky Mountain Regional Meeting of the American Chemical Society, Denver, CO, United States, August 29-September 1 (2007).
3. **P. Parhi**, A.R. Ray and A. Ramanan *Hydroxyapatite polycaprolactone based Nanocomposite* at ICMAT-2005 held at from 3rd to 8th July at Singapore (2005).

4. **P. Parhi**, A.R. Ray and A. Ramanan, *A solid state metathetic pathway to inorganic materials* at MTIC-2005 held from 8th to 10th Dec at IIT Delhi (2005).
5. **P. Parhi**, A.R. Ray and A. Ramanan *Microwave synthesis of Molybdates and Vanadates* at ICSCA-2005 held from 1st to 3rd Dec at University of Goa, Goa (2005).
6. **P. Parhi**, A. R. Ray and A. Ramanan, *Hydrothermal Synthesis of Hydroxyapatite based Biocomposites*, 4th to 6th December at IIT Kharagpur (2004).
7. **P. Parhi**, A.R. Ray and A. Ramanan, *Hydrothermal Synthesis of Hydroxyapatite based Biocomposites*, 6th International Conference on Solvothermal Reactions held on 24th to 28th August at University of Mysore, Mysore (2004).
8. **P. Parhi**, A. Ramanan and Alok. R. Ray, *Hydroxyapatite based nanocomposites*, International conference on Nanoscience and Technology held on 17th to 20th December at Calcutta (2003).
9. **P. Parhi**, A. Ramanan and Alok. R. Ray, *Microwave mediated metathesis synthesis of hydroxyapatite*, 3rd National Symposium and Conference on solid-state chemistry & Allied Areas held on 4th to 6th December at I.I.T. Delhi (2003).

Scholarships and Awards

- Qualified Junior Research Fellowship examination and National Eligibility Test for lectureship held by Council of Scientific and Industrial Research-University Grants Commission in June, 2002.
- Qualified Graduate Aptitude Test in Engineering (GATE) in 2001, Subject: Chemistry.

Extra Curricular Activity

- Represented IITD research scholar as their representative for the year 2004-2005
- Awarded as the best secy (mess secy) of NILGIRI hostel, IIT Delhi, in the year 2000, awarded for significant contribution to BHM (Board of Hostel Management), awarded for best SAC representative (Student Affairs Council) 2005.