

Name: PRAMOD H. BORSE

Qualification: PhD (*PHYSICS-Nano*)

Designation: SCIENTIST -F

Contact information:

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Experience:

10/2014-Present: *Scientist -F*, ARC-International, Hyderabad, India

2008-2014: *Scientist -E*, ARC-International, Hyderabad, India

2006-2008: *Research Professor*, Chemical Engg. Dept. POSTECH, S. K

2004-2006: *Post-Doctoral Research Professor, Material Sci & Engg Dept.*
National Research Lab (NRL), POSTECH, S.K.

2001-2003: *BK21 Post-Doctoral Research Fellow*, Synchrotron X-ray Lab,
Material Sci & Engg Dept, POSTECH, S. K.

2000-2001: *Assistant Professor in Physics*, Pune University, Pune, India
Before PhD

1994-1999: *Research Fellow*, Pune University, Pune, India

1993-1994: *Research Assistant*, National Chemical Laboratory, Pune, India

1992-1993: *Research Assistant*, Pune University, Pune, India

Research Areas of Interest –

Energy Materials: Luminescent, Solar, Thermoelectric, Magnetic
Renewable Energy generation

Thin-film deposition: Physical, Chemical, Radiation(synchrotron/laser)
Assisted methods

Condensed Matter Physics – Material modeling by computational physics

Number of PhD/ M.S./M.Tech Students Guided or Guiding (*in last 5 years*) –

Total 20 students : 3 MS(ongoing), 2 PhD (ongoing), 1 PhD (Completed)

List of Journal Publications ([to be updated](#))

1. **Borse** PH., Das D. Advance Workshop Report on Evaluation of Hydrogen Producing Technologies for Industry Relevant Application ARCI, Hyderabad, India 8–9 February 2013. Int J Hydrogen Energy 2013 (in press- DOI:10.1016/j.ijhydene.2013.06.102).
2. Dom R, Siva Kumar G., Hebalkar NY, Joshi S.V., **Borse** PH. Eco-friendly ferrite nano-composite photoelectrode for improved solar hydrogen generation. RSC Advances 2013(in press DOI: 10.1039/C3RA42051E).
3. Pareek A, Dom R, **Borse** PH. Fabrication of large area nanorod like structured CdS photoanode for solar H₂ generation using spray pyrolysis technique. Int J Hydrogen Energy 2013;38(1):36-44.
4. Dom R, Subasri R, Hebalkar NY, Chary AS, **Borse** PH. Synthesis of a hydrogen producing nanocrystalline ZnFe₂O₄ visible light photocatalyst using a rapid microwave irradiation method. RSC Advances 2012;2(33):12782-91.
5. Jeong ED, Yu SM, Yoon JH, Bae JS, Hong TE, Cho CR, Lim KT, **Borse** PH, Kim HG. Formation kinetics of crystalline Ti_{1-x}Cr_xO₂ photocatalyst from its amorphous powder. Journal of Ceramic Processing Research 2012;13(6):672-6.
6. Jeong ED, Yu SM, Yoon JH, Bae JS, Cho CR, Lim KT, **Borse** PH, Kim HG. The co-dopant concentration dependence on visible light photocatalytic efficiency in SrTi_{1-x}Fe_[x/2]Cr_[x/2]O₃ (0.01 ≤ x ≤ 0.2) perovskite photocatalysts. Journal of Ceramic Processing Research 2012;13(5):517-22.
7. **Borse** PH, Cho CR, Yu SM, Yoon JH, Hong TE, Bae JS, Jeong ED, Kim HG. Improved photolysis of water from Ti incorporated double perovskite Sr₂FeNbO₆ lattice. Bulletin of the Korean Chemical Society 2012;33(10):3407-12.
8. Dom R, **Borse** PH, Cho CR, Lee JS, Yu SM, Yoon JH, Hong TE, Jeong ED, Kim HG. Synthesis of SrFe₁₂O₁₉ and Sr₇Fe₁₀O₂₂ systems for visible light photocatalytic studies. Journal of Ceramic Processing Research 2012;13(4):451-6.
9. Jeong ED, Yu SM, Yoon JY, Bae JS, Cho CR, Lim KT, Dom R, **Borse** PH, Kim HG. Efficient visible light photocatalysis in cubic Sr₂FeNbO₆. Journal of Ceramic Processing Research 2012;13(3):305-9.
10. **Borse** PH, Kim JY, Lee JS, Lim KT, Jeong ED, Bae JS, Yoon J-, Yu SM, Kim HG. Ti-dopant-enhanced photocatalytic activity of a CaFe₂O₄/MgFe₂O₄ bulk heterojunction under visible-light irradiation. Journal of the Korean Physical Society 2012;61(1):73-9.
11. **Borse** PH. Photocatalytic and photoelectro-chemical investigations of Fe/ Sn/ Nb containing oxides for energy application: Comparative study. Journal of Physics: Conference Series 2012;365(1).
12. **Borse** PH, Cho CR, Lim KT, Hong TE, Jeong ED, Yoon JH, Yu SM, Kim HG. Comparison of Zn₂TiO₄ and rutile TiO₂ photocatalysts for H₂ production under UV and near-visible light irradiation. Journal of Ceramic Processing Research 2012;13(1):42-6.
13. Dom R, Sivakumar G, Hebalkar NY, Joshi SV, **Borse** PH. Deposition of nanostructured photocatalytic zinc ferrite films using solution precursor plasma spraying. Mater Res Bull 2012;47(3):562-70.
14. **Borse** PH, Cho CR, Lim KT, Bae JS, Jeong ED, Hong TE, Kim HJ, Kim HG. Effect of co-dopant ratio (Cr/Fe) on visible light photocatalytic activity of Cr-Fe co-doped TiO₂ nanoparticles. Journal of Ceramic Processing Research 2011;12(5):592-8.
15. Jeong ED, Jin JS, Kim HJ, Hong TE, Cho CR, Lim KT, Kim HG, **Borse** PH. Metal-ion dependent band energetics in SrM_{0.5}Ti_{0.5}O₃ (M = ru, rh, ir, pt, pd) like structures for solar applications. Journal of Ceramic Processing Research 2011;12(6):712-5.
16. **Borse** PH, Jang JS, Lee JS, Khan FN, Ha MG, Kim JP, Bae JS, Jeong ED, Kim HG. Enhanced photocatalytic properties due to electron-rich Ti-ion doping in ZnFe₂O₄ under visible light irradiation. Journal of the Korean Physical Society 2011;59(4):2750-5.
17. **Borse** PH, Cho CR, Lim KT, Lee YJ, Bae JS, Jeong ED, Kim HG. Ratio dependence of the visible light photocatalytic efficiency for Zn₂Ti_{0.9}Cr_yFe_[0.1-y]O₄: Cr/Fe (0.02 < y < 0.08) photocatalyst synthesized by using a solid state reaction method. Journal of the Korean Physical Society 2011;59(1):65-70.

18. **Borse** PH, Cho CR, Lim KT, Lee YJ, Hong TE, Bae JS, Jeong ED, Kim HJ, Kim HG. Synthesis of barium ferrite for visible light photocatalysis applications. *Journal of the Korean Physical Society* 2011;58(6):1672-6.
19. Kim HG, **Borse** PH, Jang JS, Ahn CW, Jeong ED, Lee JS. Engineered nanorod perovskite film photocatalysts to harvest visible light. *Adv Mater* 2011;23(18):2088-92.
20. Dom R, Subasri R, Radha K, **Borse** PH. Synthesis of solar active nanocrystalline ferrite, MFe_2O_4 (M: Ca, zn, mg) photocatalyst by microwave irradiation. *Solid State Commun* 2011;151(6):470-3.
21. Jang JS, **Borse** PH, Lee JS, Lim KT, Jung O-, Jeong ED, Bae JS, Kim HG. Photocatalytic hydrogen production in water-methanol mixture over iron-doped $CaTiO_3$. *Bulletin of the Korean Chemical Society* 2011;32(1):95-9.
22. Jang JS, **Borse** PH, Lee JS, Lim KT, Cho CR, Jeong ED, Ha MG, Won MS, Kim HG. Photocatalytic performance of nanocrystalline $Bi_5Ti_3FeO_{15}$ layered perovskite under visible light. *Journal of Nanoscience and Nanotechnology* 2010;10(8):5008-14.
23. Jang JS, Lee JS, **Borse** PH, Lim KT, Jung O-, Jeong ED, Won MS, Kim HG. Platinum nanoparticle co-catalyst-induced improved photoelectrical properties in a chromium-doped $SrTiO_3$ photocatalyst. *Journal of the Korean Physical Society* 2009;55(6):2470-5.
24. Jang JS, **Borse** PH, Lee JS, Lim KT, Jung O-, Jeong ED, Bae JS, Won MS, Kim HG. Energy band structure and photocatalytic property of Fe-doped Zn_2TiO_4 material. *Bulletin of the Korean Chemical Society* 2009;30(12):3021-4.
25. **Borse** PH, Yoon SS, Jang JS, Lee JS, Hong TE, Jeong ED, Won MS, Jung O-, Shim YB, Kim HG. Formation of layered $Bi_5Ti_3FeO_{15}$ perovskite in Bi_2O_3 - TiO_2 - Fe_2O_3 containing system. *Bulletin of the Korean Chemical Society* 2009;30(12):3011-5.
26. Jang JS, Yoon SS, **Borse** PH, Lim KT, Hong TE, Jeong ED, Jung O-, Shim YB, Kim HG. Synthesis and characterization of aurivillius phase $Bi_5Ti_3FeO_{15}$ layered perovskite for visible light photocatalysis. *J Ceram Soc Jpn* 2009;117(1371):1268-72.
27. Kim HG, **Borse** PH, Jang JS, Jeong ED, Jung O-, Suh YJ, Lee JS. Fabrication of $CaFe_2O_4/MgFe_2O_4$ bulk heterojunction for enhanced visible light photocatalysis. *Chemical Communications* 2009(39):5889-91.
28. **Borse** PH, Jang JS, Hong SJ, Lee JS, Jung JH, Hong TE, Ahn CW, Jeong ED, Hong KS, Yoon JH, Kim HG. Photocatalytic hydrogen generation from water-methanol mixtures using nanocrystalline $ZnFe_2O_4$ under visible light irradiation. *Journal of the Korean Physical Society* 2009;55(4):1472-7.
29. Jang JS, **Borse** PH, Lee JS, Jung O-, Cho C-, Jeong ED, Ha MG, Won MS, Kim HG. Synthesis of nanocrystalline $ZnFe_2O_4$ by polymerized complex method for its visible light photocatalytic application: An efficient photo-oxidant. *Bulletin of the Korean Chemical Society* 2009;30(8):1738-42.
30. Jeong ED, **Borse** PH, Jang JS, Lee JS, Cho CR, Bae JS, Park S, Jung O-, Ryu SM, Won MS, Kim HG. Physical and optical properties of nanocrystalline calcium ferrite synthesized by the polymerized complex method. *Journal of Nanoscience and Nanotechnology* 2009;9(6):3568-73.
31. Hong SJ, Jun H, **Borse** PH, Lee JS. Size effects of WO_3 nanocrystals for photooxidation of water in particulate suspension and photoelectrochemical film systems. *Int J Hydrogen Energy* 2009;34(8):3234-42.
32. Jang JS, Hong SJ, Lee JS, **Borse** PH, Jung O-, Hong TE, Jeong ED, Won MS, Kim HG. Synthesis of zinc ferrite and its photocatalytic application under visible light. *Journal of the Korean Physical Society* 2009;54(1):204-8.
33. **Borse** PH, Jun H, Choi SH, Hong SJ, Lee JS. Phase and photoelectrochemical behavior of solution-processed Fe_2O_3 nanocrystals for oxidation of water under solar light. *Appl Phys Lett* 2008;93(17).
34. Jeong ED, **Borse** PH, Jang JS, Lee JS, Jung O-, Chang H, Jin JS, Won MS, Kim HG. Hydrothermal synthesis of Cr and Fe co-doped TiO_2 nanoparticle photocatalyst. *Journal of Ceramic Processing Research* 2008;9(3):250-3.
35. Joshi UA, Jang JS, **Borse** PH, Lee JS. Microwave synthesis of single-crystalline perovskite $BiFeO_3$ nanocubes for photoelectrode and photocatalytic applications. *Appl Phys Lett* 2008;92(24).
36. Jang JS, **Borse** PH, Lee JS, Choi SH, Kim HG. Indium induced band gap tailoring in $ag Ga_{1-x}In_xS_2$ chalcopyrite structure for visible light photocatalysis. *J Chem Phys* 2008;128(15).

37. Kim HG, **Borse** PH, Jang JS, Jeong ED, Lee JS. Enhanced photochemical properties of electron rich W-doped $\text{PbBi}_2\text{Nb}_2\text{O}_9$ layered perovskite material under visible-light irradiation. *Mater Lett* 2008;62(8-9):1427-30.
38. Bae SW, **Borse** PH, Lee JS. Dopant dependent band gap tailoring of hydrothermally prepared cubic $\text{SrTi}_x\text{M}_{1-x}\text{O}_3$ (M=Ru,rh,ir,pt,pd) nanoparticles as visible light photocatalyst. *Appl Phys Lett* 2008;92(10).
39. Jang JS, Gyu Kim H, **Borse** PH, Lee JS. Simultaneous hydrogen production and decomposition of H_2S dissolved in alkaline water over CdS - TiO_2 composite photocatalysts under visible light irradiation. *Int J Hydrogen Energy* 2007;32(18):4786-91.
40. Bae SW, **Borse** PH, Hong SJ, Jang JS, Lee JS, Jeong ED, Hong TE, Yoon JH, Jin JS, Kim HG. Photophysical properties of nanosized metal-doped TiO_2 photocatalyst working under visible light. *Journal of the Korean Physical Society* 2007;51(SUPPL. 1):S22-6.
41. Hong SJ, **Borse** PH, Ji SM, Jang JS, Lee JS, Jeong ED, Kim HG, Pak HK. Structure of $\text{PbBi}_2\text{Nb}_2\text{O}_9$ and its cr-doped layered perovskite system and their photocatalytic activities. *Journal of the Korean Physical Society* 2007;51(SUPPL. 1):S27-31.
42. Ji SM, Jun H, Jang JS, Son HC, **Borse** PH, Lee JS. Photocatalytic hydrogen production from natural seawater. *J Photochem Photobiol A* 2007;189(1):141-4.
43. **Borse** PH, Joshi UA, Ji SM, Jang JS, Lee JS, Jeong ED, Kim HG. Band gap tuning of lead-substituted BaSnO_3 for visible light photocatalysis. *Appl Phys Lett* 2007;90(3).
44. Jeong ED, Ha MG, Won MS, Kim HG, Pak HK, **Borse** PH, Ji SM, Lee JS. Photophysical properties and electronic structure of highly donor doped (110) layered perovskite material. *Journal of the Korean Physical Society* 2006;49(SUPPL. 2):S671-4.
45. **Borse** PH, Lee JS, Kim HG. Theoretical band energetics of $\text{Ba}(\text{M}_{0.5}\text{Sn}_{0.5})\text{O}_3$ for solar photoactive applications. *J Appl Phys* 2006;100(12).
46. Jeong ED, Ha MG, Pak HK, Ryu BK, **Borse** PH, Lee JS, Komatsu T, Kim HJ, Kim HG. Thermal stabilities, physical and optical properties of $\text{K}_2\text{O-Na}_2\text{O-Nb}_2\text{O}_5\text{-TeO}_2$ glasses. *Journal of Industrial and Engineering Chemistry* 2006;12(6):926-31.
47. Jeong ED, **Borse** PH, Lee JS, Ha MG, Pak HK, Komatsu T, Kim HG. Second harmonic generation and fabrication of transparent $\text{K}_2\text{O-Na}_2\text{O-Nb}_2\text{O}_5\text{-TeO}_2$ glass-ceramics. *Journal of Industrial and Engineering Chemistry* 2006;12(5):790-4.
48. Kim HG, Jeong ED, **Borse** PH, Jeon S, Yong K, Lee JS, Li W, Oh SH. Photocatalytic ohmic layered nanocomposite for efficient utilization of visible light photons. *Appl Phys Lett* 2006;89(6).
49. Kim HG, Becker OS, Jang JS, Ji SM, **Borse** PH, Lee JS. A generic method of visible light sensitization for perovskite-related layered oxides: Substitution effect of lead. *Journal of Solid State Chemistry* 2006;179(4):1214-8.
50. **Borse** PH, Vogel W, Kulkarni SK. Effect of pH on photoluminescence enhancement in pb-doped ZnS nanoparticles. *J Colloid Interface Sci* 2006;293(2):437-42.
51. **Borse** PH, Kim HG, Lee JS. Difference in electronic structure between tetragonal and cubic SrNbO_2N . *J Appl Phys* 2005;98(4).
52. Kim HG, **Borse** PH, Choi W, Lee JS. Photocatalytic nanodiodes for visible-light photocatalysis. *Angewandte Chemie - International Edition* 2005;44(29):4585-9.
53. Ji SM, **Borse** PH, Kim HG, Hwang DW, Jang JS, Bae SW, Lee JS. Photocatalytic hydrogen production from water-methanol mixtures using N-doped $\text{Sr}_2\text{Nb}_2\text{O}_7$ under visible light irradiation: Effects of catalyst structure. *Physical Chemistry Chemical Physics* 2005;7(6):1315-21.
54. **Borse** PH, Yi JM, Je JH, Choi SD, Hwu Y, Ruterana P, Nouet G. Formation of magnetic ni nanoparticles in x-ray irradiated electroless solution. *Nanotechnology* 2004;15(6):S389-92.
55. **Borse** PH, Yi JM, Je JH, Tsai WL, Hwu Y. pH dependence of synchrotron x-ray induced electroless nickel deposition. *J Appl Phys* 2004;95(3):1166-70.
56. **Borse** PH, Kankate LS, Dassenoy F, Vogel W, Urban J, Kulkarni SK. Synthesis and investigations of rutile phase nanoparticles of TiO_2 . *J Mater Sci : Mater Electron* 2002;13(9):553-9.
57. Ranade MR, Navrotsky A, Zhang HZ, Banfield JF, Elder SH, Zaban A, **Borse** PH, Kulkarni SK, Doran GS, Whitfield HJ. Energetics of nanocrystalline TiO_2 . *Proc Natl Acad Sci U S A* 2002;99(SUPPL. 2):6476-81.
58. Kulkarni SK, Winkler U, Deshmukh N, **Borse** PH, Fink R, Umbach E. Investigations on chemically capped CdS, ZnS and ZnCdS nanoparticles. *Appl Surf Sci* 2001;169-170:438-46.

59. Vogel W, **Borse** PH, Deshmukh N, Kulkarni SK. Structure and stability of monodisperse 1.4-nm ZnS particles stabilized by mercaptoethanol. *Langmuir* 2000;16(4):2032-7.
60. **Borse** PH, Srinivas D, Shinde RF, Date SK, Vogel W, Kulkarni SK. Effect of Mn²⁺ concentration in ZnS nanoparticles on photoluminescence and electron-spin-resonance spectra. *Physical Review B - Condensed Matter and Materials Physics* 1999;60(12):8659-64.
61. **Borse** PH, Deshmukh N, Shinde RF, Date SK, Kulkarni SK. Luminescence quenching in ZnS nanoparticles due to Fe and Ni doping. *J Mater Sci* 1999;34(24):6087-93.
62. **Borse** PH, Deshmukh N & Kulkarni SK. Semiconductor Nanoparticles 1, *Physics Education* 1998; 14: 333.
63. Kumar PM, **Borse** P, Rohatgi VK, Bhoraskar SV, Singh P, Sastry M. Synthesis and structural characterization of nanocrystalline aluminium oxide. *Mater Chem Phys* 1994;36(3-4):354-8.

List of Patents (3 under preparation)

1. Indian patent application entitled " Method of Deposition of double perovskite of Sr Fe Nb-O film on substrate by spray coating technique & the coated substrate thereof" invented by **P.H.Borse**, R. Dom filed as 1151/DEL/2014 on 29/4/2014

Conference proceedings ([*to be updated*](#))

1. Dom R. Chary A.S., **Borse P.H.**; Investigation of Physico-Chemical Properties of M Fe₂O₄ (M: Ca, Zn, Mg) Photocatalysts Synthesized by Microwave Irradiation at APMS 2013 *National* conference organized by Vasavi college of engineering, Hyderabad India –2013.07.19-2013.07.20.
2. Dom R. Chary A.S., **Borse P.H.**; Microwave synthesis of solar active nanocrystalline ZnFe₂O₄ photocatalysts at NSAM *National* seminar -2013 organized by Department of physics, Osmania University, Hyderabad, Hyderabad India –2013.02.27-2013.02.28
3. Dom R, Siva Kumar G., Joshi S.V., **Borse** PH. Photoelectrochemical characterization of Fe₂O₃, ZnFe₂O₄ and composite photoelectrodes for hydrogen generation application, ELAC-2013 *International* conference conducted by society for electroanalytical chemistry of India at Ramoji film city, Hyderabad, on 2013.01.16-2013.01.20.
4. Pareek A, **Borse** P.H.; Photoelectrochemical characterization of metal semiconductor nanoparticle modified nanostructured CdS Photoelectrodes, ELAC-2013 *International* conference conducted by society for electroanalytical chemistry of India at Ramoji film city, Hyderabad, on 2013.01.16-2013.01.20.
5. **Borse** PH.; Photocatalytic and photoelectro-chemical investigations of Fe/ Sn/ Nb containing oxides for energy application: comparative study (*invited talk*), International conference on Recent trends in Physics (ICRTP2012) Devi Ahilya University, Indore, India --2012.02.04-2012.02.05
6. **Borse** PH., Formation of magnetic Ni nanoparticles in X-ray irradiated electroless solution, International symposium of Active Nano-Characterization and Technology, Tsukuba, Japan—2003.11.11-2003.11.14.
7. **Borse** PH.; Synchrotron x-ray induced nanoparticle deposition (*Invited talk*). International workshop on novel coherence based radiology techniques, Jeju Korea --2003.02.19-2003.02.22.
8. **Borse** PH. JaeMok Ye, J. H. Je, W.L. Tsai and Y. K. Hwu; Synchrotron induced nanocrystalline nickel deposition, Korean metals and materials (meeting), Seoul, S. Korea --2002.10.25-2002.10.26
9. **Borse** PH.; Investigations on Mn doped ZnS nanoparticles (*Invited talk*). International workshop on advanced materials for nanotechnology, POSTECH, S.Korea --2001.11.22-2001.11.23.
10. Ranade, M R; Navrotsky, A; Zhang, H Z; Banfield, J F; Elder, S H; Zaban, A; **Borse, P H**, Kulkarni, S K; Doran, G S; Whitfield, H J,; Energetics of nanocrystalline TiO₂. *Proceedings of*

the National Academy of Sciences of the United States of America Volume 99, Supplement 2, April 30, 2002, Pages 6476-6481.

11. Kulkarni S.K., Kundu M., **Borse P.H.**, Nanoparticles of II - VI semiconductors in Proceedings of the conference in Materials Modelling & Design, Springer Proceedings in Physics, Edited by Dr. Vijay Kumar, 1996.

Contribution to Books (*to be updated*)

1. Dom R, **Borse PH**; Investigation of solar photoelectrochemical hydrogen generation ability of ferrites for energy production. *Mat.Sci.Forum*, 2013;764; 97-.
2. Dom R, **Borse PH**. Photocatalytic and photoelectro-chemical study of ferrites for water splitting applications: A comparative study. *Materials Science Forum* 2013;734:334-48.
3. S.K.Kulkarni, A. A. Khosravi, **P.H.Borse**, N.Deshmukh, W.Vogel & J. Urban.; Structural & Optical properties of Semiconductor Nanoparticles in *Physics of Semiconductor Nanostructures*. Edited by K.P. Jain, pg. 73, 1997.

Affiliation to Professional societies

- Life Member of *Indian Physics Association*
- Member *American Physical Society(APS)*
- Life member *MRSI*
- Life member *Solar Energy Society of India*
- Special Member of *International Solar Energy Society*
- Member of *Institute of Physics (IOP), UK*
- Member of *International Electrochemical Society*
- Special Member of *Optical Society of America(OSA)*
- OSI Fellow, *Optical society of India*

Awards & Honors

- Postdoctoral Research Fellowship (BK-21), POSTECH, S.Korea, 2001
- Young Scientist Project on "Investigations of Doped Nanoparticles", by Department of Science and Technology, New Delhi, India, 2002
- Reviewer for various Elsevier, **RSC**, **ACS**, Wiley and AIP journals
- Recognized PhD guide for Osmania University, Hyderabad Central University, Andhra University
- BOS member (Physical sciences) for GNIT, Hyderabad
- Editorial board member for *International Journal of Photoenergy* and *Indian J. Material Science*
- Convenor "Advanced Workshop on Evaluation of H₂ producing technologies for Industry relevant Application" at ARCI Hyderabad 8-9 Feb 2013.