

BIBLIOGRAPHY

PART-II

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While preparing the bibliography from Scopus and Web of Science database, the keywords for the subject were used. In the process some papers might have been missed or repeated more than once. The authors would like to apologize for this lapse. Papers of particular interest, published on solution combustion synthesis have been highlighted as: interesting (), very interesting(**) and of special interest (***). Papers cited more than 100 times have been highlighted.*

1. Books

1)*** K.C. Patil, M.S. Hegde, Tanu Rattan, S.T. Aruna, Chemistry of nanocrystalline oxide materials (combustion synthesis, properties and applications); World Scientific, Singapore (2008) (No. of citations =335)

Comprehensive account of all the work on SCS carried out at Indian Institute of Science, Bengaluru.

2) Alexander G. Merzhanov, SHS research and Development, Handbook, ISMAN, Russian Academy of Sciences, Chernogolovka (1999)

3) A.S. Rogachev and A.S. Mukasyan, Combustion for Material synthesis, CRC Press: New York (2014)

2. Book Chapters

1)K. Suresh and K.C. Patil, A recipe for an instant synthesis of fine particle oxide materials in Perspectives in solid state chemistry, pp.376-388. K.J. Rao (Ed.), Narosa publishing house, 1995.

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3)K.C. Patil, S.T. Aruna, P. Bera and M.S. Hegde, 'Nanomaterials in Environment Protection and Remediation' in Chemistry for Environment (Eds G. Cao, R. Orru and F. Delogu), Cagliari, Italy (2003) 71-81.

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8)Merzhanov A. G., 40 years of SHS: A lucky star of a scientific discovery a presentation with elements of a scientific lecture, Bentham e-books, 2012.History of SHS and its growth around the world.

9)Rita Branquinho, Ana Santa, Emanuel Carlos, Daniela Salgueiro, Pedro Barquinha, Rodrigo Martins, Elvira Fortunato, Solution Combustion Synthesis: Applications in Oxide Electronics in developments in combustion technology. Edited by K. Kyprianidis, J. Skvaril, Intech, 2016

10)Bera P, Aruna S.T., Solution Combustion Synthesis, Characterization, and Catalytic Properties of Oxide Materials, in Nanotechnology in Catalysis: Applications in the Chemical Industry, Energy Development, and Environment Protection, First Edition. Edited by Bert Sels and Marcel Van de Voorde., Wiley-VCH Verlag GmbH, 2017.

3. Review articles

- 1)** Patil, K.C., Aruna, S.T., Ekambaram, S., Combustion synthesis (1997) *Current Opinion in Solid State and Materials Science*, 2 (2), pp. 158-165. (No. of citations = 354) *First review article published on SCS.*
- 2)*** Patil, K.C., Aruna, S.T., Mimani, T., Combustion synthesis: An update (2002) *Current Opinion in Solid State and Materials Science*, 6 (6), pp. 507-512. (No. of citations = 611) *This is the second review article which reviewed all the published work on SCS in between 1997-2002.*
- 3)** Ekambaram, S., Patil, K.C., Maaza, M., Synthesis of lamp phosphors: Facile combustion approach (2005) *Journal of Alloys and Compounds*, 393 (1-2), pp. 81-92. (No. of citations = 142) *First review article on lamp phosphor materials synthesized by SCS*
- 4) Tyagi, A.K., Chavan, S.V., Purohit, R.D., Visit to the fascinating world of nano-ceramic powders via solution-combustion (2006) *Indian Journal of Pure and Applied Physics*, 44 (2), pp. 113-118. (No. of citations = 15)
- 5) Mukasyan, A.S., Epstein, P., Dinka, P., Solution combustion synthesis of nanomaterials (2007) *Proceedings of the Combustion Institute*, 31 II, pp. 1789-1795
- 6)*** Aruna, S.T., Mukasyan, A.S., Combustion synthesis and nanomaterials (2008) *Current Opinion in Solid State and Materials Science*, 12 (3-4), pp. 44-50. (No. of citations = 483) *This review article described the developments and trends in combustion science towards the synthesis of nanomaterials with emphasis on various applications of combustion synthesized nanosized products*
- 7)*** Rajeshwar, K., De Tacconi, N.R., Solution combustion synthesis of oxide semiconductors for solar energy conversion and environmental remediation (2009) *Chemical Society Reviews*, 38 (7), pp. 1984-1998. (No. of citations = 148) *This review article summarizes the research on the solution combustion synthesis of oxide semiconductors for applications related to photovoltaic solar energy conversion, photoelectrochemical hydrogen generation, and heterogeneous photocatalytic remediation of environmental pollutants*
- 8)*** Hegde, M.S., Madras, G., Patil, K.C., Noble metal ionic catalysts (2009) *Accounts of Chemical Research*, 42 (6), pp. 704-712. (No. of citations = 205) *This account describes the role of SCS method for synthesizing noble metal ions substituted in ceria and their catalytic properties. Application of this catalyst as three-way catalyst for auto exhaust as well as H₂-O₂ recombination at room temperature forming water.*
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11) Rogachev, A.S., Mukasyan, A.S., Combustion of heterogeneous nanostructural systems (review) (2010) *Combustion, Explosion and Shock Waves*, 46 (3), pp. 243-266. (No. of citations =83)

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16) Pawade, V.B., Swart, H.C., Dhoble, S.J., Review of rare earth activated blue emission phosphors prepared by combustion synthesis (2015) *Renewable and Sustainable Energy Reviews*, 52, pp. 596-612. (No. of citations = 17)

17)*** Varma, A., Mukasyan, A.S., Rogachev, A.S., Manukyan, K.V., Solution combustion synthesis of nanoscale materials (2016) *Chemical Reviews*, 116 (23), pp. 14493-14586. (No. of citations = 137) *This is the latest review on SCS with 792 references which focuses on the analysis of new approaches and results in the field of versatile SCS. It describes the basic principles for controlling the composition, structure of SCS products, routes to regulate the size and morphology of the nanomaterials and several application categories of SCS produced materials.*

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4. Structural Ceramics

Alumina and related oxides

- 1) J.J.Kingsley, K.C.Patil, A novel combustion process for the synthesis of fine particle α -alumina and related oxide materials, (1988) *Materials Letters*, 6 (11-12), pp. 427-432. **(No. of citations=538)** *This is the first publication on the serendipitous discovery of solution combustion synthesis of alumina.*
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Cordierite, Mullite, NASICON and Synroc Materials

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10. Patents on Solution Combustion

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- 2) Reactor for using combustion synthesis of inorganic powders for ceramics - comprises solution, Kurosky R P, Maupin G D, Chick L, Battelle Memorial Inst(BATT-C), AUS5705132-A, 1998.
- 3) Method for manufacturing dielectric particulate powder of an electroluminescent device by modified self- using combustion synthesis of nonequilibrium synthesis KR2000032814-A ; KR273721-B, Park S, Song J S, Lee G R, Park S(PARK-Individual), 2001.
- 4)Method for producing phosphor based on oxide by using combustion synthesis, Pak C S, Yang Y S, Park J S, AHAE Corp (AHAE-Non-standard), KR2002083650-Y1 ; KR2002083650-A ; KR417607-B, 2003.
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- 6) Preparation for alpha-type nanometer aluminum oxide powder by combustion synthetic method, Zhai X, Wang X, Lu Z, Univ Northeastern(Unen-C) China Aluminum Corporation(CNAL-C) CN1439603-A ; CN1227160-C, 2004.
- 7) Synthesizing nano crystal cobalt aluminum spinel pigment by using solution combustion method, Li W, Li J, Guo J, Shanghai Silicate Inst Chinese Acad Sci(CAGU-C), CN1443811-A ; CN100523094-C, 2004.
- 8) Doped lithium nickelate low temperature combustion synthetic method, Ye N, Huang X, Hong W, Wu J, Guilin Eng College (GUIL-Non-standard), CN1549361-A ; CN1234178-C, 2005.
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- 22) Dielectric ceramics for dielectric antenna, comprises strontium, lithium, titanium, oxygen, rare earth element and neodymium as constituent element, and is obtained by combustion, synthesis method, Ohira T, Ntn Corp(Ntnt-C), JP2008056530-A, 2008.
- 23) Elastomer composition used for electronic component such as mobile telephone and cordless phone, is obtained by mixing ceramic with elastomer containing preset amount of strontium, lithium, titanium, neodymium and/or rhenium, Ohira T, Ntn Corp(Ntnt-C), JP2008112586-A, 2008.
- 24) Method for synthesizing of nickel cobalt manganate lithium comprises mixing, adding water and ammonia, controlling pH, adding precipitating agent, drying, adding water or alcohol to lithium acetate, regulating rheologic phase, and tempering, Tian H, Ye N, Liu D, Guilin Eng College (Guil-Non-Standard), Univ Guilin Technology(Uygi-C), CN101215011-A ; CN100591624-C, 2008.
- 25) Transparent ceramic laser material for solid heat capacity laser comprises rare earth doped hafnium dioxide and gadolinium oxide solid solution, where rare earth ion is niobium, ytterbium, cerium, praseodymium, europium, thulium or terbium, Feng T, Shi J, Jiang D, Shanghai Ceramic Chem & Technology Inst(Cagu-C), Chinese Acad Sci Shanghai Inst Ceramics(Cagu-C), CN101247021-A ; CN101247021-B, 2008.
- 26) Process for preparation of nano-structured multielement oxide for lithium ion battery, M. W R, Basu R N, Maiti H S, Nath B R, Raja M W, Sekhar M H, India Defence Res & Dev Org(INIA-C), IN200602773-I1 ; IN262170-B, 2009.
- 27) Catalyst, useful e.g. for selective reduction of nitrogen oxide emitted by a stationary/mobile source and an internal combustion engine, comprises components e.g. molybdenum oxide and cerium oxides, Cheng H, Li Y, Okada A, Wang S, Xie Y, Gang T, Corning Inc(Corg-C), Chinese Acad Sci Dicp (Chsc-Non-Standard), Cas Dalian Chem & Physical Inst(Cacp-C),

Chinese Acad Sci Dalian Chem Phys Inst(Cacp-C), WO2008150462-A2 ; CN101314127-A ; WO2008150462-A3 ; CN101314127-B, 2009.

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30) Cathode for lithium battery comprises cathode active material coated on current collector of cathode, where cathode active material comprises solid-solution composite of lithium metal oxides and inactive material surface-coated with carbon, Park K, Park K S, Samsung Sdi Co Ltd(Smsu-C), Samsung Denkan KK(Smsu-C), US2009155694-A1 ; JP2009152197-A ; KR2009066021-A ; JP5435934-B2 ; KR1430616-B1, 2009.

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33) Preparing fine particles comprises mixing atomized precursor mist with flow of drying gas into reactant stream, generating swirling flow of stream, and passing via reactor, controlling residence time of stream and removing dried particles, Adiga KC, Nanomist Systems LLC (NANO-Non-standard), US2009186757-A1 ; US7744786-B2, 2009.

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35) Manufacturing method of extremely fine particles and porous materials for uniform drying of heat sensitive materials e.g. foods, pharmaceuticals, propellant involves transferring reactant stream through dryer tube in helical flow, Adiga KC, Nanomist Systems LLC (NANO-Non-standard), US2009044421-A1 ; US7524442-B2, 2009.

36) Preparing long-persistence luminescent paper comprises carrying out low-temperature synthesis of long-persistence luminescent powder, carrying out treatment, coating, and base paper printing of long-persistence luminescent powder, Lin R, Ye X, Zhou L, Univ Guangdong Lighe Ind Inst Technology (Uygu-Non-standard), CN101691718-A ; CN101691718-B, 2010.

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43) Luminescent material exhibiting a temperature-dependent luminescence decay time useful as a temperature-sensitive component of a temperature-sensitive paint or coating, comprises chromium(III) doped yttrium aluminum borate, Klimant I, Borisov S, Gatterer K, Melsungen Ag B(Bint-C), EP2354208-A1 ; WO2011095530-A1, 2011-K05474

44) Synthesizing nanocrystalline metal powders comprises forming combustion synthesis solution by dissolving an oxidizer, fuel and base-soluble ammonium salts of e.g. tungsten and rhenium in water, and heating combustion synthesis solution, Frye J G, Weil K S, Lavender C A, Kim J Y, Battelle Memorial Inst(Batt-C), Frye J G(Frye-Individual), Weil K

S(Weil-Individual), Lavender C A(Lave-Individual), Kim J Y(Kimj-Individual), US2011194970-A1 ; US9802834-B2, 2011.

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46) Method for auto-combustion synthesis of nano zinc oxide (ZnO) powder, Roy P, Crompton Greaves Ltd(Crgr-C), IN200801634-I3, 2011.

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50) Low temperature combustion synthesis of tungsten carbide micropowder used for gas diffusion electrode, by mixing ammonium tungstate, urea, and nitric acid, heating, grinding, and carrying out carbonization reaction with argon gas, Cui L, Li P, Li Y, Qu X, Wan Q, Yin H, Zhang W, Zhai F, Univ Beijing Sci & Technology(Unbs-C), CN102674352-A; CN102674352-B, 2012.

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- 53) Preparing metal oxide nanopowder used for producing ceramics, comprises subjecting metal oxide nanopowder dispersion to ultrasonication, allowing dispersion to settle and centrifuging to obtain supernatant comprising metal oxide nanopowder, Kim W, Villalobos G R, Sanghera J S, Aggarwal I D, Us Sec of Navy (Usna-C), US2013243679-A1; US8646612-B2, 2013-N51556
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- 55) Microwave combustion synthesis of magnesium oxide/yttrium oxide nanopowder by preparing ternary system from any of yttrium nitrate, magnesium nitrate, palladium acetate and magnesium acetate, mixing with water and microwave combusting, Gong H, Li T, Tan S, Sun H, Zhang Y, Univ Shandong(Usha-C), CN103951392-A; CN103951392-B, 2014-S95399
- 56) Catalyst used for dimethyl oxalate vapor phase hydrogenation of ethylene glycol and glycolic acid methyl ester comprises soluble copper salt, metal salt containing other metals, and nano-titanium dioxide as catalyst carrier, Dai W, Chen X, Cui Y, Wang B, Wen C, Univ Fudan (Uyfu-C), CN104492445-A, 2015-34176Q
- 57) Combustion synthesis of lanthanum magnesium borate powder by adding lanthanum nitrate hexahydrate, magnesium nitrate hexahydrate, boric acid and glycine in corundum crucible, adding distilled water, mixing, heating and regulating pH, Chu G, Hua C, Yan Y, Zhang J, Cui X, Huo H, Gu H, Univ Liaoning Petroleum & Chem. Technology (Uyli-Non-standard), Univ Liaoning Shihua (Uyli-Non-standard), CN104528753-A ; CN104528753-B, 2015.
- 58) Self-propagating combustion synthesis of bismuth vanadate photocatalyst involves adding starch to mixed solution of bismuth salt and vanadium salt, stirring, pouring obtained paste solution into crucible, and heating, : Hu C, Zhou H, Zhong Y, Zhu B, Univ Guilin Electronic Technology(Uyge-C), CN105032397-A, 2015.
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- 61) Preparing yttrium ferrite powder comprises e.g. taking yttrium nitrate and ferric nitrate, adding deionized water, dissolving, adding reducing agent, stirring, carrying out combustion

synthesis reaction, and cooling, Duan L, Cheng M, Jiang G, Xu J, Xu D, Shanghai Inst Technology(Shgh-C), CN105540677-A ; CN105540677-B, 2016.

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64) Manufacture of aluminum-substituted langatite for e.g. sensor, involves heating raw material containing lanthanum, tantalum, gallium and aluminum at predetermined temperature, carrying out solution combustion synthesis, and heating, Akiyama T, Koike R, Zhu C Y, Univ Hokkaido(Uhok-C) Citizen Holdings Co Ltd(CITL-C), JP2016172648-A, 2016.

65) New self-carrier oxygen storage material, obtained by combustion synthesis method comprising adding nitrate solution into the beaker, heating until the solution into a dry gel, drying, igniting, and calcinating, Gao Y, Xiao R, Ceng D, Peng S, Zhang Q, Zhang Z, Chen P, Univ Southeast(Uyse-C), CN106976916-A, 2017

66) Soil amendment composition used for remediation of heavy metal contaminated soil and as liner for hazardous waste containment facilities, comprises essentially of calcium nitrate, fumed silica and citric acid, Fakrudeen S P, Mohammed S A S, Mohammed S A S(Moha-Individual) Fakrudeen S P(Fakr-Individual), IN201502765-I4, 2017.

67) Making high purity niobium powders, comprises forming combustion synthesis solution by dissolving oxidizer, fuel and base-soluble, ammonium salt of niobium in water and heating solution to remove water and initiate self-sustaining reaction, Frye J G, Weil K S, Lavender C A, Kim J Y, Battelle Memorial Inst(Batt-C) US2018037975-A1, 2018.

68) Production of catalyst for synthesizing ammonia, involves reducing calcium aluminate supporting ruthenium compound until particle diameter of ruthenium is increased to preset value than particle diameter of ruthenium before reduction, Hosono H, Kawamura S, Kishida K, Kitano M, Li J, Yokoyama T, Tokyo Inst Technology(TOKD-C) Tsubame BHB Co Ltd (TSUB-Non-standard), WO2018030394-A1 ; TW201811426-A., 2018.

69) Preparation of ultrafine-crystalline tungsten-based gas spark switch electrode involves combusting ammonium metatungstate, ammonium nitrate, glycine and rare-earth oxide, mixing

nano tungsten powder and binder and sintering mixture, Qin M, Chen Z, Chen P, Li R, Wu H, Jia B, Qu X, Univ Beijing Sci & Technology(UNBS-C), CN107737951-A, 2018.

70) Preparing nano nickel oxide cathode material of lithium ion battery, comprises e.g. adding nickel acetate into muffle furnace, heating to predetermined temperature, maintaining the temperature for predetermined time, taking out, and cooling, Huang J, Zhao D, Zhou P, Fujian Xiangfenghua New Energy, CN107792890-A, 2018.

71) High flux combustion synthesis device used for preparing powder material includes matrix raw material reagent bottle, quality control valve, mechanical arm, computer, solution storage tank, feeding system, and atomizing device, Qin M, Wu H, Jia B, Lu H, Zhang L, Qu X, Univ Beijing Sci & Technology(UNBS-C), CN107892329-A, 2018.

72) Catalyst used for oxidative removal of methane from exhaust streams, e.g. motor vehicle exhaust and petroleum refining exhaust, comprises nanoparticulate palladium species, non-hierarchical ceria and non-hierarchical alumina, Khader M M, Al-Marri M J, Ali S, Abdelmoneim A G, Kumar A, Univ Qatar (UYQA-Non-standard), WO2018096385-A1, 2018.

73) Nickel/spinel catalyst composite used in production of high-temperature synthesis gas, comprises nickel-metal dopant-aluminum oxide, where content of nickel is determined by absence of X-ray diffraction peak intensity at preset angles, Lin J, Christie G M, Lin J(Linj-Individual) Christie G M(CHRI-Individual) Praxair Technology Inc(PRAX-C), US2018141028-A1 ; WO2018098064-A1 ; US10010876-B2, 2018.

Appendix

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- 1) J.J. Kingsley, Studies on fine particle alpha alumina and related oxides prepared by a novel combustion process (1989).
- 2) S. Sundar Manoharan, Combustion synthesis and properties of fine particle spinel, perovskite and K_2NiF_4 type oxides (1991).
- 3) K. Suresh, Combustion synthesis and properties of fine particle oxides: Studies on ferrites (1992).
- 4) R. Gopichandran, Combustion synthesis, characterization, sintering and microstructure of mullite and cordierite ceramics (1993).
- 5) N. Arul Dhas, Studies on zirconia and related oxides: Combustion synthesis and properties (1994).
- 6) M.M. Amala Sekar, Combustion synthesis and properties of ferroelectrics, relaxors and microwave resonators (1995).
- 7) S. Ekambaram, Combustion synthesis and properties of lamp phosphors (1996).
- 8) M. Muthuraman, Studies on titanate based multi-phase ceramics: Prospective radioactive waste storage materials (1997).
- 9) T. Sushil Kumaran Rajan, Studies on oxide, nitride and oxynitride ceramics (1997).
- 10) S.T. Aruna, Combustion synthesis and properties of nanosized oxides: Studies on SOFC materials (1998).
- 11) Samrat Ghosh, Ceramic Pigments: Combustion synthesis and properties (1998).
- 12) Parthasarathi Bera, Promoting effect of ceria in combustion synthesized M/CeO_2 catalysts ($M = Cu, Ag, Au, Pd$ and Pt) for environmental catalysis (2002).
- 13) K. Nagaveni, Synthesis, structure and photocatalytic activity of nano-titania (2004).
- 14) Arup Gayen, Synthesis of nano- $Ce_{1-x}M_xO_{2-\delta}$ ($M = Cu, Ru, Rh, Pd$ And Pt) : Enhancement of redox-catalytic activity due to $Mn^{+}-O^{2-}-Ce^{4+}$ ionic interaction (2005).
- 15) Tinku Baidya, Synthesis, structure and redox catalytic properties of Pt and Pd ion substituted $Ce_{1-x}M_xO_2$ ($M = Ti, Zr$ & Hf) oxygen storage capacity nano-materials (2008).

- 16) Sounak Roy, Noble metal and base metal ion substituted CeO₂ and TiO₂ : Efficient catalysts for NO_x abatement (2008).
- 17) Sudanshu Sharma, Gas phase and electrocatalytic reaction over Pt, Pd ions substituted CeO₂, TiO₂ catalysts and electronic interaction between noble metal ions and the reducible oxide (2009).
- 18) Preetam Singh, Novel synthesis of transition metal and noble metal ion substituted CeO₂ and TiO₂ nanocrystallites for hydrogen generation and electro-chemical applications (2010).
- 19) A. Gupta, Structure and oxygen storage capacity of Ce_{1-x}M_xO_{2-δ} (M= Sn, Zr, Mn, Fe, Co, Ni, Cu, La, Y, Pd, Pt, Ru): Experimental and density functional theory study (2010).
- 20) R. Vinu, Catalytic and adsorption properties of nanomaterials (2010).
- 21) Parag Deshpande, Development of nanocatalysts for hydrogen production (2011).
- 22) Ujwala Ail, Thin film semiconducting metal oxides by nebulized spray pyrolysis and MOCVD, for gas-sensing applications, 2011
- 23) Sharad Sonattake, Photocatalytic degradation of microorganisms (2012).
- 24) Dipankar Saha, Synthesis and catalytic properties of nanomaterials (2012).
- 25) Vijay Shinde, Development of catalysts for the production of syngas (2013).
- 26) B. D. Mukri, Synthesis, structure and catalytic properties of Pd²⁺, Pt²⁺ and Pt⁴⁺ ion substituted TiO₂ (2013).
- 27) Prashant Pendyala, Characterization and control of nanoscale roughness (2014).
- 28) Vinayak B. Kamble, Studies on effect of defects, doping and additives on Cr₂O₃ and SnO₂ based metal oxide semiconductor gas sensors, 2015.
- 29) Dr Baburao N Sherikar, Investigations of Solution combustion Process and their Utilization for Bioceramic applications, 2015.
- 30) Krishna Rao Eswar, Development of antibacterial coatings using nanomaterials (2016).
- 31) Snehash Shivananda Ail, Combustion synthesized cobalt catalysts for liquid fuel generation via Fischer Tropsch reaction (2016).
- 32) Disha Jain, Development of ionic catalysts for methane reforming (To be submitted).
- 33) Satyapaul Singh, Development of ionic catalysts for reforming (To be submitted).

34) Ch. Anil, Development of nanomaterials for energy applications (To be submitted).