CURRICULUM -VITAE

KALPESHKUMAR BHIKHUBHAI SIDHPURIA

C/O, Prof. Dr. Joao A. P. Coutinho
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OBJECTIVE:

To pursue the knowledge, that can strengthen and sharpen my academic, practical, theoretical and communicative skills and capability which accumulate me proficient for compete the global challenges in the field of research and persuade my interior strength to do something for the societal mission.

EDUCATIONAL QUALIFICATION:

2008	Ph. D. (Chemistry) from V. N. S. G. University, Surat, India
2002	M. Sc. (Organic Chemistry) from S. G. University, Surat, India
1999	B. Sc. (Chemistry) from S. G. University, Surat, India
1996	H. S. C. from G. S. E. Board, Gandhinagar, India

ACADEMIC PERFORMANCE:

Course/ Exam	Institute/ University	Year of Passing	% Marks Obtained	Grade	Major Subjects
Ph.D. (Chemistry)	V. N. South Gujarat University, Surat (Formerly known as South Gujarat University)	**Title of the Thesis:** "*Studies on Catalytic Hydrogenation of Aromatics using Metal Supported Zeolites and Clays for Producing Clean Transportation Fuels*"			
M.Sc.-Organic Chemistry					
M.Sc.-II	South Gujarat University, Surat	2002	57.42 Agg. 62.50	Second Class	**Organic Chemistry**
M.Sc-I		2001	59.60	Second Class	
B.Sc.-Chemistry					
B.Sc.-III	South Gujarat University, Surat	1999	60.44	First Class	**Principal:** Chemistry **Subsidiary:** Petro-chemicals
B.Sc.-II		1998	58.00	Second Class	
B.Sc.-I		1997	61.00	Second Class	
H.S.C.	Gujarat Secondary Education Board	1996	47.23	Second Class	Chemistry, Physics, Mathematics, Biology
S.S.C.	Gujarat Secondary Education Board	1994	62.71	First Class	Mathematics, Science, English

PRESENT POSITION:

Working as a **FCT-Post-Doctoral Research Fellow** with Prof. Dr. Joao Coutinho and Dr. Tito Trindade at CICECO-Department of Chemistry, University of Aveiro, Aveiro, Portugal.

RESEARCH EXPERIENCE:

- Four years experience in the field of metal supported zeolite and clay based catalysts synthesis, characterization and catalytic activity measurements with Dr. R.V. Jasra, Prof. P. Bahadur and Prof. P. A. Parikh.
- Worked as **Project Assistant (Level III)** in externally funded Project at Discipline of Inorganic Materials & Catalysis, Central Salt & Marine Chemicals Research Institute, Bhavnagar, Gujarat from **February 8, 2008 to November 30, 2008**.
- Worked as a **Project Assistant** in CSIR-Network Project at Discipline of Inorganic Materials & Catalysis, Central Salt & Marine Chemicals Research Institute, Bhavnagar, Gujarat from **February 2, 2005 to February 1, 2008**.
- Working experience of material (especially nano-crystalline zirconia, mixed metal oxides and zeolites) synthesis and characterization using different techniques with Dr. R.V. Jasra and Dr. (Mrs.) Beena Tyagi.
- Working experience in the field of liquid phase adsorption of dyes and organic matter using low cost natural adsorbent with Dr. Mousumi Chakraborty, Head & Assistant Professor, Chemical Engineering Department, SVNIT, Surat.

WORK EXPERIENCE:

Industry Worked as **Plant Chemist** at M/s, Tribeni Dyes, Surat from June 1999 to February 2001.

Academic Worked as **Laboratory Assistant** at S. V. National Institute of Technology, Surat (Formerly known as Regional Engineering College, Surat) from August 2001 to April 2004 on temporary basis.

COMPUTER KNOWLEDGE:

- Certificate in Computing from Indira Gandhi National Open University, New Delhi (IGNOU), with First class (63 %).
- MS-Office, Internet, etc.
- ChemDraw-10.0, Origin, Polymath-5.1 software.

ASSIGNMENTS PERFORMED:

- ***Synthesis, characterization and catalytic hydrogenation of aromatics using metal supported zeolites:***

  Commercially obtained Naβ and Na-ZSM-5 zeolites were ion exchange with ammonium salt solution to obtain ammonium (NH_4^+) exchanged zeolites. These zeolites were further treated to convert into protonic (H^+) form. Rhodium (Rh) metal was impregnated on sodium and protonic zeolites by wetness impregnation technique to obtain the metal supported zeolites. Thus prepared metal supported zeolites were used for the aromatic hydrogenation to produce clean transportation fuels. This study was carried out in high pressure catalytic fixed bed reactor

(continuous flow reactor) and toluene was used as a model compound to simulate the aromatics in diesel fuels.

- ***Simplified synthesis of isomorphously nickel substituted nanocrystalline ZSM-5:***

  Isomorphously nickel-substituted nano-crystalline ZSM-5 was synthesized in the absence of acidic aqueous fluoride medium incorporating simple and low-cost metal inorganic salt precursor $NiCl_2.6H_2O$ instead of large organic cationic salt like bis (tetraethyl ammonium) tetrachloronickelate (II) with less water quantity to minimize the synthesis waste. PXRD, FT-IR, TG/DTG, XPS, UV-VIS DRS, SEM, TEM, ICP and N_2 adsorption-desorption techniques were used to confirm the presence of nanocrystalline material having an MFI structure and heteroatom substitution. The crystallite size of as-synthesized samples was in the range of 60-75 nm, which increased to 60-160 nm after calcination.

- ***Hydrogenation of aromatic compounds over rhodium metal nanoparticles intercalated montmorillonite (MMT):***

  Rhodium (Rh) metal nanoparticles were synthesized by exchanging $[Rh(NH_3)_6]^{+3}$ ions for interlayer Na^+, K^+ or Ca^{+2} ion in MMT which were subsequently reduced by sodium borohydride by one of my colleague and I have performed the catalytic activity study of thus prepared material for the hydrogenation of aromatic compounds. The hydrogenation of different aromatic substrates such as benzene, toluene, *o,m,p*-xylenes, naphthalene and anthracene were studied under varied operating conditions in the high pressure PARR autoclave (batch type reactor) reactor. The study was carried out in the absence and presence of sulfur source (thiophene).

- ***Benzene hydrogenation using ruthenium (Ru) grafted hydrotalcite:***

  Ruthenium grafted hydrotalcite or layered double hydroxide (LDH) was synthesized by one of the member of our group and I have measured its catalytic activity for the hydrogenation of benzene in a high pressure PARR autoclave (stirred batch type) reactor. Reaction parameters such as temperature, pressure, substrate/catalyst ratio and amount of solvent were optimized for maximum conversion.

- ***Synthesis and characterization of nanocrystalline mesoporous zirconia using supercritical drying:***

  Nano-crystalline (4-6 nm), thermally stable, tetragonal zirconia aerogels having high specific surface area and porosity with narrow and uniform pore size distribution were prepared by sol-gel technique and supercritical drying using *n*-propanol as a solvent under supercritical temperature (235-280 °C) and pressure (48-52 bar) of *n*-propanol. For comparison, zirconia xerogel samples have also been prepared by conventional thermal drying method. The structural (crystallinity, crystalline phase and crystallite size) and textural (surface area, pore volume and pore size distribution) characterization was done in detail to understand the effect of gel drying methods on these properties.

- ***Synthesis of nanocrystalline zirconia using sol-gel and precipitation techniques:***

  Nanocrystalline zirconia samples having predominantly tetragonal crystalline phase were synthesized using sol-gel and conventional precipitation techniques

from zirconium hydroxide precursor obtained by the hydrolysis of both zirconium propoxide and zirconium oxychloride precursors, respectively. The effect of thermal drying of zirconia gel in an oven and under vacuum has also studied. The structural and textural properties, namely, crystallite size, crystalline phase, phase transformation with increasing temperature, surface area, and pore volume of zirconia samples prepared by both techniques are determined and compared with a special emphasis on the stabilization of nanocrystalline tetragonal phase and its transformation into nanocrystalline monoclinic zirconia.

- ***Synthesis, characterization and catalytic activity of SiO_2-ZrO_2 mixed oxide xerogel and aerogel:***

  A series of ZrO_2-SiO_2 mixed oxides xerogel and aerogel were prepared by sol-gel method with different molar ratio of ZrO_2 and SiO_2. Ex-situ sulfation was carried out to further enhance the acidic properties of the mixed oxides. Dehydration of cyclohexanol and 4-methyl-2-pentanol reactions have been studied in vapor phase fixed bed reactor at atmospheric pressure to evaluate the Brønsted acidity and catalytic activity of mixed oxides samples. Effect of drying, Zr:Si ratio and sulfation have been co-related with the structural, textural and catalytic properties of as such and sulfated ZrO_2-SiO_2 mixed oxides.

- ***Dye and organic matter removal from wastewater using low cost adsorbents:***

  Effective adsorbents have been developed from bagasse fly ash, thermal fly ash, rice husk, jute thread and sawdust and successfully employed for the removal of dye, ACRY red 4G from aqueous solutions and organic matter from dairy industry wastewater. Factors influencing the adsorption process, e.g., pH, contact time, adsorbent doses and adsorbent particle size are investigated. A continuous method for removal of ACRY red 4G dye from wastewater without prior treatment using all solid adsorbents such as bagasse fly ash, thermal fly ash, rice husk, jute thread and sawdust has also been studied.

PUBLICATIONS:

- See ANNEXURE-I

PAPER/POSTERS PRESENTED IN CONFERENCE/SYMPOSIUMS:

- See ANNEXURE-II

INSTRUMENTS HANDLED:

- UV-VIS Spectrophotometer, Elico, India
- Shimadzu-17A, Japan Gas Chromatograph instrument
- HP-6890 series Gas Chromatograph instrument
- Surface Area Analyzer-ASAP-2010, Micromeritics, USA
- Catalytic Fixed-Bed Reactor System with PC-PLC (Programmable Logic Controller) and operating through Ellipse SCADA Software
- High pressure 100 ml autoclave reactor (PARR and Autoclave Engineers)

DATA ANALYSIS:

- Experience of interpreting analytical data of PXRD, FT-IR, TGA, Surface Area Analysis, UV-VIS, Pore Size Distribution, Mass and GC.
- Experience of interpreting SEM and TEM analysis.

LANGUAGE ABILITIES:

Mother Tongue	Gujarati
Other languages known	English, Hindi

EXTRA CURRICULAR ACTIVITIES:

- Hindi language Exams Certificates by Gujarat Vidhyapith, Ahmedabad
- National Cadet Corps (NCC) Army Wing 'B' Certificate from Ministry of Defence, Government of India
- Participated in Annual Training Camp of NCC Army Wing held at Baroda, Gujarat during December 19, 1996 to December 30, 1996
- Participated in Annual Training camp and Pre-Basic Leadership Camp of NCC Army Wing held at Navsari, Gujarat during October 14, 1997 to October 25, 1997
- Participated in National Integration Camp of NCC Army Wing held at Gorakhpur, Utter-Pradesh during December 07, 1998 to December 18, 1998
- Participated in Inter Collegiate Weight Lifting competition

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REFERENCES:

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Dr. (Mrs.) Beena Tyagi
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PERSONAL PROFILE:

Name	**: Sidhpuria Kalpeshkumar Bhikhubhai**
Date of Birth	**:** 09-11-1979
Gender	**:** Male
Marital Status	**:** Married
Nationality	**:** Indian
Father's Name	**:** Shri Bhikhubhai Sanmukhlal Sidhpuria
Mother's Name	**:** Smt. Jyotsnaben Bhikhubhai Sidhpuria
Wife's Name	**:** Smt. Bina Kalpeshkumar Sidhpuria
Hobbies/Interests	**:** Listing music, Cricket, Reading, Traveling
Permanent Address	**:** 4/331, Panch-Hatdi Road, Opp. Ramji Mandir, Rander, Surat-395 005, Gujarat, INDIA
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ANNEXURE-I

PUBLICATIONS

Book Chapter:

1. Nano-materials as Adsorbents and Catalysts in Chemical Process Industry.
   Beena Tyagi, **Kalpesh B. Sidhpuria** and Raksh Vir Jasra
   Encyclopedia of Nanoscience and Nanotechnology (second edition), American Scientific Publishers, USA (**Invited Chapter, Accepted**).
2. Sol-Gel Technology for Nano-materials Synthesis.
   Beena Tyagi, **Kalpesh B. Sidhpuria** and Raksh Vir Jasra in "New Nanotechniques" Edited by Frank Columbus, Nova Science Publishers, Inc., New York, USA **(Invited Chapter)**

Papers:

3. Rhodium Nanoparticles Intercalated into Montmorillonite for Hydrogenation of Aromatic Compounds in the Presence of Thiophene
   Kalpesh B. Sidhpuria, Hasmukh A. Patel, Parimal A. Parikh, Pratap Bahadur, Hari C. Bajaj and Raksh V. Jasra
   Appl. Clay Sci., 42 (2009) 386-390
4. Influence of the Surface Acidity of ZSM-5 Support on the Catalytic Activity of Rh/ZSM-5 for Hydrodearomatization of Toluene.
   Kalpesh B. Sidhpuria, Parimal A. Parikh, Pratap Bahadur, Beena Tyagi and Raksh Vir Jasra
   Catal. Today 141 (2009) 12-18
5. Rhodium Supported Hβ Zeolite for the Hydrogenation of Toluene.
   Kalpesh B. Sidhpuria, Parimal A. Parikh, Pratap Bahadur and Raksh Vir Jasra
   Ind. Eng. Chem. Res., 47 (2008) 4034-4042
6. Simplified Synthesis of Isomorphously Nickel Substituted ZSM-5.
   Kalpesh B. Sidhpuria, Parimal A. Parikh, Pratap Bahadur and Raksh Vir Jasra
   J. Porous Mater., 15 (2008) 481-489
7. Fresh and Calcined Supported 12-tungstosilicicacid: Synthesis, Characterization and Application to Some Acid Catalyzed Reactions.
   Nikunj Bhatt, Anjali Patel, Parasuraman Selvam and **Kalpesh Sidhpuria**
   J. Mol. Catal. A: Chem., 275 (2007) 14-24

8. Synthesis of Nano-crystalline Zirconia using Sol-Gel and Precipitation Techniques.
   Beena Tyagi, **Kalpesh Sidhpuria**, Basha Shaik and Raksh Vir Jasra
   Ind. Eng. Chem. Res., 45 (2006) 8643-8650
9. Synthesis and Characterization of Nano-crystalline Mesoporous Zirconia using Supercritical Drying.
   Beena Tyagi, **Kalpesh Sidhpuria,** Basha Shaik and Raksh Vir Jasra
   J. Nanosci. Nanotechnol., 6 (2006) 1584-1593 [A Special Issue on Self-Assembled Nanomaterials].
10. Studies on Equilibrium and Kinetics of ACRY Red 4G from Aqueous Solutions using Low Cost Adsorbents.
    Kiran Prajapati, **Kalpesh Sidhpuria**, Dharmesh Mahajan and Mousumi Chakraborty
    Indian J. Chem. Tech., 12 (2005) 425-429
11. Removal of Organic Matter from Dairy Industry Wastewater Using Low Cost Adsorbents.
    Kiran Prajapati, **Kalpesh Sidhpuria** and Mousumi Chakraborty
    Beverage & Food World 32 (2005) 51-53
12. Aromatic Saturation: A Means to Cleaner Transportation Fuels.
    K. B. Sidhpuria and P. A. Parikh
    Bull. Catal. Soc. India, 3 (2004) 67-71
13. Various Control Techniques of NO_X.
    Kalpesh Sidhpuria, Kiran Prajapati, Mousumi Chakraborty and P. A. Parikh
    Chemical Weekly, May 25, 2004, pp.185-190
14. Bioremediation: Applications in Food Industries.
    Kiran Prajapati, **Kalpesh Sidhpuria** and Mousumi Chakraborty
    Beverage & Food World, 31 (2004) 15-18
15. Membrane Bioreactor: Principles, Design and Applications.
    Kiran Prajapati, **Kalpesh Sidhpuria**, Dharmesh Mahajan and Mousumi Chakraborty
    Chemical Weekly, February 24, 2004, pp.183-187

Manuscripts Communicated/under preparation:

16. Synthesis, Characterization and Catalytic Activity of SiO_2-ZrO_2 Mixed Oxide Xerogel and Aerogel: Effect of Si/Zr Molar Ratio and Sulfation.
    Beena Tyagi, **Kalpesh B. Sidhpuria,** Basha Shaikh and Raksh Vir Jasra

17. Benene Hydrogenation over Ruthenium Grafted Hydrotalcite.
    Kalpesh B. Sidhpuria, Sumit K. Sharma, Parimal A. Parikh, Pratap Bahadur and Raksh Vir Jasra
18. α-Pinene Isomerization over SiO_2-ZrO_2 Mixed Oxide Xerogel and Aeogel.
    Beena Tyagi, **Kalpesh B. Sidhpuria** and Raksh Vir Jasra
19. Effect of Various Calcination Conditions on the Structural and Textural Properties of Sulfated Zirconia.
    Beena Tyagi, **Kalpesh B. Sidhpuria** and Raksh Vir Jasra

ANNEXURE-II

CONFERENCE/SYMPOSIUMS

Oral Paper/ Poster Presented:

1. Toluene Hydrodearomatization over Rh supported ZSM-5 for Cleaner Transportation Fuels.

   Kalpesh B. Sidhpuria, Parimal A. Parikh, Pratap Bahadur and Raksh Vir Jasra

   Poster Presented at 18th National Symposium & Indo-US Seminar on Catalysis held at Indian Institute of Petroleum, Dehradun during April 16-18, 2007.

2. Synthesis and Characterization of Isomorphously Nickel Substituted ZSM-5.

   Kalpesh B. Sidhpuria, Parimal A. Parikh, Pratap Bahadur, Raksh V. Jasra

   Poster presented at Royal Society of Chemistry-West India Section (RSC-WIS) Student Symposium-2006 held at Department of Chemistry, The M.S. University of Baroda, Vadodara on October, 13 &14, 2006.

3. Hydrodearomatization of Toluene for Cleaner Transportation Fuels.

   Kalpesh B. Sidhpuria, Parimal A. Parikh, Pratap Bahadur, Raksh V. Jasra

   Poster presented at 4th All Gujarat Research Scholars' Meet-2006 (AGRSM-2006) held at Applied Chemistry Department, The M.S. University of Baroda, Vadodara organized by Indian Chemical Society on January 22, 2006.

4. Effect of Si/Zr Molar Ratio and Sulfation on Physico-Chemical Properties of SiO_2-ZrO_2 Mixed Oxides.

   Kalpesh B. Sidhpuria, Beena Tyagi, and R.V. Jasra

   Paper presented at XXII-Gujarat Science Congress-2008 held at Bhavnagar University, Bhavnagar on March 9, 2008.

5. Synthesis of Pd and Rh Metal Nanoparticles in the Interlayer Space of Organically Modified Montmorillonite.

   Hasmukh A. Patel, **Kalpesh B. Sidhpuria**, Hari C. Bajaj, Raksh V. Jasra

   Paper presented at XXII-Gujarat Science Congress-2008 held at Bhavnagar University, Bhavnagar on March 9, 2008.

6. 4-Methyl-2-Pentanol Dehydration over SiO_2-ZrO_2 Mixed Oxide Xerogel and Aerogel Prepared by Sol-Gel Technique.

   Beena Tyagi, **Kalpesh B. Sidhpuria** and Raksh Vir Jasra

   Poster Presented at 18th National Symposium & Indo-US Seminar on Catalysis held at Indian Institute of Petroleum, Dehradun during April 16-18, 2007.

7. Synthesis and Characterization of SiO_2-ZrO_2 Mixed Oxides Xerogel and Aerogel Prepared by Sol-Gel Technique.

   Beena Tyagi, **Kalpesh B. Sidhpuria** and Raksh Vir Jasra

   Poster presented at International Conference on Materials for the Millennium (MatCon-2007) held at Department of Applied Chemistry, Cochin University of Science and Technology (CUSAT), Kochi during March 1-3, 2007.

8. Nano-crystalline Nano-porous Zirconia using Supercritical Drying.

   Beena Tyagi, **Kalpesh Sidhpuria**, Basha Shaik and Raksh Vir Jasra

   Paper presented at 4th All Gujarat Research Scholars' Meet-2006 (AGRSM-2006) held at Applied Chemistry Department, The M.S. University of Baroda, Vadodara organized by Indian Chemical Society on January 22, 2006.

9. Effect of Supercritical Drying on Nano-Crystalline Zirconia.

   Beena Tyagi, **Kalpesh Sidhpuria**, Basha Shaik and Raksh Vir Jasra

   Poster presented at National Symposium on Modern Trends in Inorganic Chemistry (MTIC-XI) held at Department of Chemistry, Indian Institute of Technology-Delhi, New Delhi during December 8-10, 2005.

Participation in Conference/Symposiums:

10. One day National workshop on 'Nanoscience & Nanotechnology in the Context of Physics' (NNCP-08) held at Department of Physics, Bhavnagar University, Bhavnagar on August 23, 2008.
11. 'All India Seminar on Nanotechnology from Chemical Engineering Perspectives' held at Department of Chemical Engineering, Dharmsinh Desai University, Nadiad on November 11, 2006.
12. 'National Seminar on Polymers, Surfactants and Gels' (NSPSG) held at Department of Chemistry, The M.S. University of Baroda, Vadodara during March 11-13, 2005.