

SUMMARY

- Over 12 years teaching & Research in university level and having industrial experience of oil field.
- Expertise in managing the scale, Asphaltene, paraffin and wax - deposit, prevention, inhibition and control.
- Strong knowledge of synthesis of Polymers and ability to characterization the polymers through various analytical techniques like TGA, DSC, GPC and SEM.
- Expertise in conducting practical through instrumental techniques like Gas chromatography , F.T.i.r. Spectroscopy, UV Spectroscopy, GFAAS, ICP, HPLC, XRD and XRF.
- Strong knowledge of Petroleum Refining process and ability to handle the project research work in oil field and having the strong knowledge of catalyst activity in various Refinery processing and operation.
- Expertise to handle the sophisticated analytical instruments and maintenance.
- Expertise in teaching of Advance Analytical chemistry, General chemistry and Industrial chemistry. Strong teaching ability and student motivation skill.
- Expertise in Trouble – shooting of Analytical Instruments.
- Expertise in FCCU Catalyst Refining process and development of Alumina based catalyst.
- Removal of toxic metal ions by using adsorption and separation technique through catalyst.
- Sulphur analysis in petroleum products in different streams through modern techniques.
- Experience and actively involved in DHDS & DHDT, Panipat Refinery, commissioning.
- Perform testing of samples and quality control specimens using specified methodology of ASTM, GRACE, UOP, EURO - III.
- Develop and Update Laboratory Standard Operating Procedure (SOP), Maintain QA/QC documents and certifications. Assist and resolve client issues, Make technical presentation to client, Assist and market Laboratory services to the potential clients.
- Computer Knowledge in application of LAB analysis and preparation of Lab Reports (LIMS).
- Carry out above responsibilities, and all others which may be assigned, in a manner demonstrating support for and adherence to the Company's Safety Policy and Procedures, GLP, Quality Policy, ISO 9002, Six Sigma, Occupational Health policy and Procedures, Ethics Policy, Environmental Management System, Vision and Strategy, and to exercise good judgment, common sense, and diplomacy in so doing.

EDUCATION

Doctorate of Philosophy in Science -Industrial Chemistry, 2001 – 2006

Alagappa University, Karaikudi, India

Topic: Studies on some copolymers as Antiscalants for cooling waters.

Bachelor of Education in Chemistry, 1996-97

Annamalai University, Chidambaram, India

Master of Science in Chemistry, 1993-95

St.Joseph's College, Bharathidasan University. India

Project Topic: Polymer supports for metal ion anchoring

Bachelor of Science in Chemistry, 1990-93

Madurai Kamaraj University, India.

Technical Qualification

Post graduate Diploma in Industrial water and waste water Treatment, 1998- 99

Alagappa University, India.

PROFESSIONAL EXPERIENCE

Research Associate , July 2008, present

Petroleum Engineering Dept, Petroleum Institute, Abu Dhabi, UAE

- Currently handling the research projects in polymers area applied in Asphaltene, Waxes, scales problems in Upstream oil field reservoir.
- Guiding to the student projects.
- Supervise and maintain the research lab .
- Expertise with good background of mineral scale formation in oil fields
 - the basic ideas of mineral scale formation
 - oilfield brine compositions and how these lead to different scales
 - calcite scale, mixed Ba/Sr/Ca/SO₄ scales and more exotic scales
- Expertise in scale prevention by using chemical scale inhibitors
 - basics of scale control using scale inhibitors
 - how scale inhibitors work mechanistically
 - topside scale control and downhole squeezing
 - introduction to downhole squeezing of scale inhibitors
- mechanistically
 - the role of core flooding in scale inhibitor selection with field examples
 - assessing and avoiding formation damage when applying scale inhibitors in squeeze processes – field examples
- The design of field scale management programmes
 - assessing the problem
 - designing a laboratory programme for field scale control
 - screening methods for scale inhibitors for specific field scaling problems
 - bulk jar and tube blocking tests for inhibition efficiency – interpretation of what these tests mean
- Working in the advanced topics in field squeeze design
 - scale inhibitor treatments in horizontal well
 - scale prevention in subsea wells
 - scale inhibitor placement – back to basics on the theory and practice of
- working in the impact of the reservoir on the field scaling problem
 - where does scale form in the total reservoir/production system
 - reservoir scale predictions of the scaling problem

Chemical Analyst, Jul – 2006- Jul-2008

Bahrain petroleum company, Bahrain

- Experience in analysis , training the chemists , report preparation , looking after quality and Analytical work, handling analytical instruments, calibration & standardization, trouble -shooting and Quality auditing. Development of new methods and Update Laboratory Standard Operating Procedure (SOP). Ensure the safety of the experiment and comply to follow the safety procedures. Expertise in commissioning of new analysis testing instruments, project preparation and documentation.
- Catalyst characterization for FCCU –Catalyst. Catalyst Particle size Distribution (PSD), APS through Laser particle analyzer (Malvern –master size instrument), Apparent Bulk Density (ABD), Loss on ignition (LOI), Pore volume (PV), Surface Area (SA) via amount of Nitrogen adsorbed/desorbed, chemical composition Analysis :Na, Fe, Al₂O₃, RE₂O₃, V, Ni, Cu, Sb for FCCU Catalyst sample by using the Dispersive X-ray and ICP technique. Carbon on regenerated Catalyst (CRC) for

FCCU spent catalyst and Platformer catalyst by using combustion technique through LECO-CS200 ICON instrument. Catalyst testing carry out as per guidance of Grace Davison , Refining Technologies , Europe.

- Analysis of Phosphoric acid in Polymerization Catalyst. Total chloride in Alumina and Silica – Alumina Catalysts by Potentiometric titration (UOP method 291-89), Trace level metal analysis in catalyst through ICP. Coke and chloride testing for Platformer-CCRU Catalyst. Good knowledge of understanding , How catalyst characteristics affect the circulation of fluid. I have good experience in lab level and worked in the RON-octane improving project by changing the catalyst micron size and temperature difference.
- Compositional Analysis of Fuel gas, Tail gas, Stabilizer gas vapour, Natural gas, Khuff gas, Off gas L.P.G. through Gas Chromatography. Analysis of ethane, ethylene, propane , propylene, Benzene, Toluene, Xylene purity analysis through GC. Simulated distillation (Simdist) analysis for hydrocarbons. Calculation of density and calorific value for recycle gas. Work with multi level integrated project teams to achieve the technical solutions. Light ends in Crude oil through chemopack Gas chromatography.
- Experience in the PPb level Sulphur analysis in ULSD (ultra low sulphur diesel) through furnace technique and Sulphur analysis in Kerosene, ATF, LVGO, HVGO, Vac. residue samples through XRF technique. Design of experiment for new analysis. analysis in hydrocarbon liquids. Determination of Total SULPHUR / NITROGEN in petroleum products by UV-Flourescence / Chemiluminescence detection method (ANTEK9000VNS/HN-Furnace technique).
- SULPHUR in LPG, Diesel (in the range from 0.1 to 500 ppm) by Hydrogenolysis and Ratiometric colorimetry through (C.I.A.analytics 2010L). Acid gas, Tail gas and fuel gas analysis for SRU/ARU. Characterization of sulphur compound. Knowledge of regenerate the activity of catalyst sites in refining process of SRU. Moisture, and trace level metal analysis. Good knowledge of maximum Claus recovery concept MCRC for sulphur production. Understanding the terminology of condensation and adsorption of sulphur compound in clause process.
- Di ethanol Amine H₂S and Mercaptane SULPHUR analysis for SRU samples through Metrohm 798 titrator. Spent caustic, H₂S analysis through colour development method –UV spectrophotometer, doctor and reverse doctor test. H₂S and mercaptane Sulphur analysis in liquid hydrocarbons include gasoline, naptha, light cycle oils through Ion-selective potentiometry titration. Diesel and kerosene SULPHUR analysis through lamp combustion technique for sulphur analysis. High level H₂S analysis in Sour water and stripped water through iodimetry titration. Elemental micro analysis (S for lighter HC, N- for reactor outlet, Cl- for Naptha) through Euroglas instrument for petroleum products.
- Basic Nitrogen analysis for reactor outlet of OHCU, which is poisonous for catalyst. Analysis of fuel oil for metal analysis. Al & Si, Trace level metal analysis for through AAS- Graphite furnace technique. MTBE Analysis in MS samples by using FT-IR technique. Determination of PNA- poly cyclic nuclear aromatics in middle

distillate through High Performance Liquid Chromatography with RI detector (range 1.00-1.75 RIU) technique as per IP391-01 method.

QCO- Analytical, Jan 1998 – July 2006

INDIAN OIL CORPORATION LTD, Panipat Refinery, Panipat. India.

- Trace metal analysis in HVGO, LVGO which is poisonous for catalyst, As and Hg in light hydrocarbons, which is ppt level through furnace FAAS and ICP. Heavy metals for Furnace oil and vacuum residue.
- Paraffines, Olefines, Napthenes, Aromatics (PONA- Analysis), LPG Potential, Propylene Purity, Hydro Carbons composition analysis by *Gas Chromatography*. Poly cyclic Hydrocarbons by *HPLC and FT.i.r.*. Particulate size analysis for FCCU catalyst & regenerated catalyst and coke & sulphur analysis in catalyst
- Experience in Hydrogen Unit sample analysis, Pressure swing absorption PSA o/l samples analysis for H₂, CH₄, CO₂, CO, O₂, N₂ and purity of Hydrogen by Refinery Gas Analyser through Chromatographic techniques (RGA-GC). HGU- RB-202 A & B Sulphur analysis by Raney Nickel method. Flue gas analysis by Orsat Method.
- Experience in the Boiler water analysis, Cooling tower water analysis and process water analysis, waste water and Drinking water Analysis. I have to maintain water quality as per Pollution Control norms. I have experience and also worked in reducing Hydrogen Sulphide through Hydrogen Peroxide in our Refinery Polluted water.
- AVU- CDU, VDU, CCRU, RFCCU, HGU, OHCU, VBU, BBU, DHDT, SRU units sample analysis and Finished products Quality analysis through sophisticated Analytical instruments.

Technical

- Solubilities of selected inorganic compounds in tertiary mixtures.
- Fundamental aspects of cooling water and boiler water chemistry.
- Cooling and boiler water treatment, operations and control.
- Water treatment specifications and program implementation.
- Development of new cooling and boiler water additives.
- Water systems management.
- Petroleum and petrochemical process side corrosion control and antiscalants.
- Waste water management.
- Many specialized marketing studies, training programs and manuals, covering various aspects of water chemistry, cooling and boiler water treatment and related topics.

Lecturer, Mar 1995 - Dec 1997

K.K.College of Pharmacy, Chennai

Dr.M.G.R.Medical University . India.

- Experience in of Advanced Analytical chemistry, General Chemistry and Industrial chemistry subjects : Theory papers and practical.
- Revised course curriculum - included revising laboratories and lab schedule, redesigning and beefing-up the exam portion of the course, and redistributing the student workload to better represent the nature of the course.
- Developed the on-line aspects of the course from scratch.

- Extensively knowledgeable in polymer characterization techniques .
- Substantially knowledgeable in the area of polymer synthesis .

Instruments Training:

- Under gone advanced Analytical instruments training at INDIAN OIL CORPORATION LTD , R&D Centre, Faridabad, New Delhi.
- Under gone **ICP & Gas Chromatography** training at Toshniwal Instruments Ltd., Nashik.
- Under gone AVIATION TURBINE FUEL TESTING training at IOCL, Marketing Division, Bijuwasan Terminal, New Delhi.
- *Cetane Engine* Testing training from **CORE LAB, U.S.A.**

Instruments handled:

- Atomic Absorption Spectro Meter (GBC-Avanta, Australia)
- FAAS & ICP furnace atomic absorption spectro meter (Perkin Elmer , U.S.A)
- GPC –HP-HT- Polymer lab (Varian, UK.)
- Digital Microscope 3500x (Hirox, Japan)
- U.V. visible Specro photo Meter (Hach, U.S.A.)
- Flame photo Meter (Chemito, India)
- Ion Selective Meter (U.K.), Auto Titrator (mettler, Japan)
- Conductivity Meter, Turbidity Meter (Hach, U.S.A.)
- F.T. ir . Spectro Meter (Perkin Elmer, U.S.A.)
- X-ray Fluorescence Spectro Meter (XRF-Oxford, U.K.)
- Gas Chromatographs (Thermo quest, Italy)
- HPLC & G.C-MS (Agilent , U.S.A)
- Auto Distillation unit (A D 86 5G ISL, France)
- R.V.P (Herzog, Germany)
- Auto Vacuum Distillation unit (D - 1160, ISL, France),
- Flash Point (ISL FP 170 5G)
- Freezing Point (Linetronic, Switzerland).
- CFR Engine Testing – RON , MON and Cetane Number CORE LAB (U.S.A.),

Projects handled:

- Polymer supports for metal ion anchoring
- Synthesis of different form of Alumina based activated catalyst using for Arsenic removal in Drinking water.
- Studies on copolymer used as a antiscalant in cooling system

Paper presentation

1. **B. Senthilmurugan** & B Ghosh Title – Low molecular weight co-polymer for calcium scale inhibition at high temperature, Accepted SPE: International Symposium on Oilfield Chemistry, 20-22 April -2009 , The Woodlands , Texas, USA.
2. **B. Senthilmurugan** & B Ghosh – A threshold scale inhibitor for high temperature application, The 20 th International Oilfield Chemistry Symposium 22-25 March -2009 , Geilo, Norway.
3. B Ghosh & **B. Senthilmurugan** – Self selective Water control technology for fractured horizontal wells – A rig – less option, The 20 th International Oilfield Chemistry Symposium 22-25 March -2009 , Geilo, Norway.
4. **B.Senthilmurugan** - Studies on Acrylic acid – 4-Amino Benzene Sulphonic acid copolymer as a Antiscalant in cooling system in Corrosion Conference -2006, CECRI at Karaikudi.
5. **B.Senthilmurugan** - Studies on Removal of H₂S in Refinery spent caustic streams through optimized hydrogen peroxide treatment at IOCL, R&D , New Delhi .

Work shop attended

1. SPE: Applied technology workshop: "Managing Scale and Asphaltene Challenges in Mature Oil & Gas Fields" 9-12 Feb -2009, Abu Dhabi, UAE.