Pooja Ranganathan

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EDUCATIONAL BACKGROUND: Integrated M.Sc. Program from Bits Pilani

M.Sc. (Hons) Chemistry	Bits Pilani, Hyderabad Campus	8.35/10	2018
B.E.(Hons) Mechanical Engineering	Bits Pilani, Hyderabad Campus	8.35/10	2018

PROFESSIONAL EXPERIENCE:

Bits Pilani, Hyderabad Campus **Project Assistant** **Jan 2022 - June 2022**

- Synthesis of Magnetite nanoparticles and subsequent surface derivatization with Dopamine carried out for attaining higher suspension stability of the nanofluid (aqueous solution). A multi-step synthesis procedure involving further quaternization of amine group of Dopamine, treatment with a silver salt ($AgNO_3$), in an attempt to enhance thermal properties of the fluid.
- A study of thermal conductivity and viscosity parameters was conducted to weigh on the figure of merit. Further work planned for optimizing the compositional ratio of Magnetite and Dopamine in the nanofluid.
- Characterization of the surface functionalized nanomaterial with XPS, UV-Visible Spectroscopy, XRF and XRD to determine the composition and stability.

Nanomaterials Research Laboratory, NAL Bengaluru **September 2021**

- Manuscript titled "Thermal oxidation of stainless-steel substrate with tunable spectral selectivity: Transition from a reflecting to a highly absorbing Cr-Fe spinel surface" accepted for publishing in the journal "Solar Energy Materials and Solar Cells"

Indian Institute of Science, Bengaluru **Project Assistant** **Nov 2019 – May 2020**

- Devised a centrifugal compressor for an air-cycle machine of the 'Tejas' aircraft, a fighter jet of the Indian Defence. The project was in collaboration with DARE-DRDO to optimize the design of the same.
- Calculated the parameters such as the blade angles, impeller radius and the coefficients subjected to a specific mass flow rate.
- Developed a 3D model of the 2-kw compressor in 'Bladegen' and carried out 40-50 simulations in Ansys CFX for optimizing aerodynamic performance.

RESEARCH PROJECTS:

Enhancement of Spectral Selectivity of metals by air annealing and surface modification Jan 2018 – June 2018

- Heat treatment parameters of annealing time and annealing temperature were optimized for enhancing the spectral selectivity of metal/alloy surfaces, thereby increasing solar absorption.
- Compositional and optical properties of the so formed oxide later on SS 304 was conducted to rationalize the increase in solar absorption.

Synthesis and characterization of TiO_2 nanoparticles for nanofluid application Aug 2017 - Dec 2017

- The Microwave Synthesis of TiO_2 Nanoparticles was carried out, a following functionalization with Graphene Oxide (with water as solvent). The chemical functionalization of GO was an advantage to stabilize the nanoparticle suspension in the solution
- The time period of photocatalytic reduction of the TiO_2-GO composite nanofluid was optimized for a prolonged dispersion of nanoparticles
- The samples were characterized by XRD, UV Visible Spectroscopy, FTIR Spectroscopy, Raman Spectroscopy and DLS for experiments and analysis.

INTERNSHIPS:

Hindustan Aeronautics Limited (Engine Division) **Summer Intern** **May 2016 - June 2016**

A comprehensive insight gained about turbo-prop, turbo-jet aero-engines, their manufacturing, assembly and testing units in one of the Asia's largest assembly line facility.

CSIR-Central Leather Research Institute **Summer Intern** **Apr 2015 - June 2015**

Conducted a study-oriented project at the department of Council of Scientific and Industrial Research (CSIR), on the materials utilized in hydro turbines installed in marine waters

ACADEMIC COURSES:

Material Sciences and Engineering
Colloidal Chemistry
Solid State Chemistry
Electrochemistry
Fundamentals of Thermodynamics
Fluid Mechanics
Mechanics of Solids
Prime movers and Fluid Machines

PAPERS/PUBLICATIONS:

Pooja Ranganathan, V. Amrutha, H.C. Barshilia, Thermal oxidation of stainless-steel substrate with tunable spectral selectivity: transition from a reflecting to a highly absorbing Cr–Fe spinel surface, Sol. Energy Mater Sol. Cells, 233 (2021), Article 111381, https:/doi.org/10.1016/j.solmat.2021.111381

CO CURRICULAR ACTIVITIES:

- A tyro in playing violin of the Indian Classical Carnatic form of music, proficiency till Swarajathis
- Quizzing enthusiast with having hosted quiz sessions online
- Member of Yuva BPHC - an organization that aids the orphanages in and around the city of Hyderabad
- Successfully organized Fast-track Automotive workshop - Engine expo for the first time in Atmos 2016, with over 800 attendees
- Participated in the organization team for "Open Day" of 2020 in Indian Institute of Science. Explained variable flows in sharp and submerged weirs through hands-on experiments to the attendees.