Binayak Lamsal

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Summary

Passionate and dedicated Chemical Engineer with comprehensive knowledge across multiple engineering areas, including Nanotechnology, Quantum Physics, Process Engineering, Adsorption Processes, Air pollution control, Scrubber system designs, and Water quality assessment. Skilled in Chemical Analysis, Process designs, and Safety evaluation, with working knowledge of Chemical engineering design, Simulations and Piping and Instrumentation diagrams. Hands-on involvement in Nanofibers fabrication and designs, Electrospinning techniques, Optimizing and experimenting on scrubber designs, and conducting detailed water quality experiments.

Skills

Programming Languages Python, C

Engineering Softwares Aspen Plus, Aspen HYSYS,Materials Visualizer,dmol3,CASTEP, Aspen Adsorption,COMSOL Multiphysics, Autocad Plant3D, Autodesk Fusion 360, Solidworks

Soft Skills Listening, Persistence, Patience, Teamwork, Leadership

Projects

Impact of socio-cultural activities on water quality of River (Research,Manuscript only-not published) Dec 2021-Mar 2022

- Tested the river water of Shankhu river for festive period of one month
- Analyzed the water parameters such as BOD,COD,DO,Turbidity,pH,E.coli,etc.
- Compared the parameter data during the crowded festive period with sample before and after the festive period

Determining the location of SO2 on the Ni(111) surface Jul 2025-Sep 2025

- Performed Density functional theory based modeling to investigate the structure of SO2 and SO3 on Cu(111) and Ni(111) and compared the results with experimental findings
- Used Adsorption locator to investigate the field of adsorption sites thus to find the higher density of points showing more likely location

Modeling inhibitor adsorption onto a Pigment Red crystal face Jul 2025-Sep 2025

- Built a crystal surface of Pigment Red with enough and directed space for ihibitor binding
- Calculated binding energies to evaluate the potential of a 2-phenylglycine additive

Computing band structure and density of states of AlAs semiconductor Sep 2025

- Built a primitive cell model for AlAs semiconductor to calculate the band structure plot.
- Examined the number of energy states at the Fermi level and the states that arise from each type of orbital, s, p, or d using the Partial Density of state plot.

Predicting the lattice parameters of AlAs from first principles Oct 2025

- Built an AlAs crystal structure and optimized the geometry using CASTEP geometry optimization tool
- Built a conventional cell and compared the lattice vector with experimental one to find the lattice vector as 5.371 Å with 1 percent error between the two.
- Analyzed the electron density, Brulion zone path in the band structure and finally made the iso-surface within the primitive cell structure.

Work Experience

Research Assistant,Green Decisions Lab-Lalitpur, Nepal Sep 2024-Nov 2024

- Worked on experimentation with novel Drum Scrubber systems to capture PM emission
- Optimized and redesigned the existing design to improve the PM capture efficiency to 92 percent from 50 percent

Freelance Chemical Engineer ,Tundra Engineering Inc- Calagry, Canada May 2025

- Developed a simulation model for an existing Wood Pyrolysis plant.
- Simulated the process conditions, helped to predict the Syn-gas temperature and products composition for a specific feed.

Freelance Chemical Engineer , Carbon Recovery Innovations LLC - Virginia, USA Jul 2025- Sep 2025

- Developed a simulation model of a Non-Reducible Plastic Pyrolysis plant and performed the overall capital cost estimation
- Simulated the process conditions, verified the reactions and product composition

Freelance Chemical Engineer , Energy Interface Inc - Pittsburg, USA Sep 2025- Oct 2025

- Developed a simulation model of steam vessel with four Thermosiphon vapor Condensers
- Identified the return streams of heat exchangers causing water hammer risks
- Helped to optimize nozzle designs and identify the water hammer mitigation measures.

Education

Pulchowk Campus, Institute of Engineering, B.E in Chemical Engineering July 2021– April 2025

Shikshadeep Higher Secondary School, Grade 11, 12 Science June 2018– May 2020

References

Prof.Dr.Sahira Joshi, Department Head,Department of Applied Sciences and Chemical Engineering

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