**SAI PRASAD NAYAK**

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**SUMMARY**

Experienced in the field of nanotechnology and electrochemistry enabling international collaborations, solving vital research problems related to detection of biomolecules and fuel cell applications thereby publishing high impact research works.

**EDUCATION**

**Doctor of Philosophy in Chemistry,** *Sri Sathya Sai Institute of Higher Learning, India.* (*2017 – July, 2022; CGPA:7.8*). Topic: *“Green nanocomposites as electrocatalysts for detection of biomolecules and*

*fuel cell applications*”.

**Master of Science in Chemistry,** *Sri Sathya Sai Institute of Higher Learning, India,*

*Graduated with* ***a gold medal*** *for academic excellence* (*2015 - 2017; CGPA: 8.2*).

**Bachelor of Science,** *Chemistry (Hons),**Utkal University, India., (2012 - 2015; CGPA: 7.2).*

**RESEARCH EXPERIENCE**

* Developed an energy-efficient process for galvanostatic deposition of a novel porous gold-curcumin nanocomposite as a thin film on the electrode surface for fuel cell applications
* Interpreted the mechanism behind the electrochemical synthesis of gold-curcumin nanocomposite which could be applicable to similar metal-ligand combinations.
* Engineered the gold-curcumin electrode surface, for picomolar and real-time detection of dopamine in human urine samples.
* Synthesized reduced graphene oxide decorated with silver nanoparticles using plant extracts for electrochemical detection of dopamine and uric acid.
* Spin coated various silver halloysite architectures on silver slides and recorded their Surface Plasmon Coupled Emission properties with a hand-held spectrophotometer, and a cell-phone as a next-gen plasmonic sensor.
* Used Gaussian 16 to optimize metal-organic complexes and calculated their complex forming energy, and adsorption energy.
* Assisted in a project entitled “ANIRVID” aiming at discovering depression biomarker in perinatal Indian women population, where I supported in data collection as well as sample processing, preservation and biochemical analysis.

**RESEARCH INTEREST**

Catalysis, Nanomaterials, Graphene, Electrosynthesis, Fuel cells, Sensors.

**SKILLS**

Critical thinking, Problem solving, Teamwork, Leadership, Project Management, Collaboration.

**TECHNICAL SKILLS**

XRD, TEM/SEM, EDX, UV, IR, TGA, DLS, BET, Raman, Electrochemical techniques along with handling potentiostat.

**PROFESSIONAL EXPERIENCE**

* Reviewed manuscripts of Internationally reputed journals such as Elsevier and Nature
* Taught “ENT 201-Environmental science and Human values” course to the first year Bachelor of Science and Commerce students comprising a class of 70 students
* Participated in the Sakura Science Exchange Programme, 2019, worked at *Matsumi laboratory, JAIST, Japan* on the project “Solar power assisted green synthesis of silver-graphite nanocomposite using titanium dioxide as a reducing agent”.

**PUBLICATIONS**

* **Nayak S. P.**, Lakshman K. V., Ramamurthy S. S., Kumar J. K. K. and Rao A.M., Green Synthesis of a Novel Porous Gold-curcumin Nanocomposite for Super-Efficient Alcohol Oxidation, **Nanoenergy**, 2022.
* **Nayak S.P.**, Srinivasan V., Badiya P.K., Kumar J.K., Ramamurthy S.S., Engineering metal-dielectric nanostructures involving silver decorated Halloysite for augmented surface plasmon-coupled directional emission, ***Physica E Low Dimens. Syst. Nanostruct.***, p.114718, 2021.
* **Nayak S. P.**, Ramamurthy S. S., and Kumar J. K, Green Synthesis of Silver Nanoparticles Decorated Reduced Graphene Oxide Nanocomposite as an Electrocatalytic Platform for the Simultaneous Detection of Dopamine and Uric Acid, **Mater. Chem. and Phys.,** 252, 123302, 2020.
* Badiya P. K., Siddabattuni S., Dey D., Javvaji S. K., **Nayak S. P.**, Hiremath, A. C., ... & Vaitheswaran S., Identification of clinical and psychosocial characteristics associated with perinatal depression in the south Indian population, **Gen. Hosp. Psychiatry**, *66*, 161-170, 2020.
* Badiya, P.K., Srinivasan, V., **Nayak S.P.**, S.S. Ramamurthy, Low-Cost Plasmonic Carbon Spacer for Surface Plasmon-Coupled Emission Enhancements and Ethanol Detection: a Smartphone Approach. Plasmonics **13,**519–524, 2018.
* **Nayak S.**P., Lakshman K. V., Kumar J. K. K. and Rao A.M., A porous gold-curcumin nanocomposite for picomolar dopamine detection and real-time ultra-selective detection of dopamine in urine, (*communicated to ACS material letters*).
* **Nayak S.**P., Lakshman K. V., Kumar J. K. K. and Rao A.M, Porous Gold-Curcumin Nanocomposite for Enhanced Electrooxidation of Glycerol and Ethylene glycol (*Under preparation*).
* **Nayak S.**P., V. Pratyusha, Kumar J. K. K., Eco-friendly Surface Modification of Oxidized Carbon Nanotubes with Curcumin for Simultaneous Electrochemical Detection of Dopamine and Serotonin (*under review in Material Chemistry and Physics*)

**CONFERENCES**

* **Nayak S. P.**, Lakshman K. V., Ramamurthy S. S., Kumar J. K., & Rao A. M., Enhanced Hydrogen Evolution Reaction by Porous Curcumin Enveloped Gold Nanoparticles, ***ECS Meeting Abstracts*** (No. 54, p. 1884). IOP Publishing, 2021.
* **Nayak S. P.,** Ramamurthy S. S., & Kumar J. K., Electrodeposition of Gold Nanoparticles on Halloysite Nanotubes Modified Glassy Carbon Electrode for Detection of Dopamine and Serotonin, ***ECS Meeting Abstracts*** (No. 56, p. 1442), IOP Publishing, 2021.

**INVITED TALK**

* 3rd International conference on “Biocatalysis and Green Chemistry” on the topic “green synthesis of a novel porous gold-curcumin nanocomposite for efficient alcohol oxidation” in April, 2022, organized by Coalesce research group, USA.

**VOLUNTEERING**

* Coordinated various field-events as part of annual sports and cultural meet, Sri Sathya Sai Institute of Higher Learning during 2018-2020.
* Led a self-reliance group of 15 students in the institute for maintenance of college playground and 4 students for systematic functioning of hostel photocopy department.
* Trained students for various competitive exams (e.g., B.Ed., D.Ed.) in chemistry and physics.
* Elected as the "Student Representative" in the department of chemistry to facilitate colloquiums, talks, and welcome/farewell functions during the bachelor’s program.

**EXTRA-CURRICULAR ACTIVITIES**

Singing, Elocution, Reading, Veda-chanting, Marathons, Social service.