

## Anup Kumar Singh

Physical & Material Chemistry Division  
CSIR-National Chemical Laboratory, Pune

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### Education

**Ph.D. (2020)**, (1<sup>st</sup> division with Distinction, 8.7 CGPA)

Polymer Science & Engineering Division, CSIR-National Chemical Laboratory, Pune, India-411008

**M.Sc. (2013)**, (1<sup>st</sup> division with 8.0 CGPA)

Organic Chemistry Specialization, Banaras Hindu University, Varanasi, India-221005

**B.Sc. (2009)**, (1<sup>st</sup> division with 7.9 CGPA)

Chemistry (Hons.), Banaras Hindu University, Varanasi, India-221005

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### Highlights

Accomplished synthetic organic chemist with 8+ years of experience in

- Synthesis of Conducting polymers
  - Organic small molecules and dyes synthesis
  - Fabrication of Nanocomposites, Polymer composites, and Hydrogels
  - Colloidal & Supramolecular chemistry
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### Research Experience

#### **Postdoctoral Senior Project Associate**

**Aug 2022-To date**

Physical & Material Chemistry Division

CSIR-National Chemical Laboratory, Pune, Maharashtra, India

Advisor: Dr. Jayaraj Nithyanandhan

Project title: **Rationally Designed Dendron Bearing Conjugated Polymers for Flexible Energy Storage Devices**

#### **Doctoral Research**

**Aug 2016-Dec 2020**

Polymer Science & Engineering Division

CSIR-National Chemical Laboratory, Pune, Maharashtra, India

Advisor: Dr. Kothandam Krishnamoorthy

Project title: **Self-Assembly of i-Indigo Molecules**

#### **Project Assistant**

**July 2013-June 2014**

Department of Chemistry, Faculty of Science

Banaras Hindu University, Varanasi, U.P., India

Advisor: Prof. Biswajit Ray

Project title: **Synthesis of RAFT agents for RAFT-Polymerization.**

## **Master Project**

**Dec 2012-May 2013**

Department of Chemistry, Faculty of Science

Banaras Hindu University, Varanasi, U.P., India

Advisor: Prof. Ranjana Khanna

Project title: **Dendrimer synthesis via “Click-chemistry”**

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## **Skills**

### **Synthetic expertise:**

- **Organic synthesis:** Handling the reactions in both wet and dry atmosphere (glove box); Handling explosive, sophisticated and sensitive reactions.
- **Polymer Synthesis:** Synthesis of alt-Copolymers & Polymers, Resin formation.
- **Composite Synthesis:** Hydrogels formation, fabrication of polymer scaffolds, and organic-inorganic hybrid-composites.
- **Dye synthesis:** BODIPY, Isoindigo, Diketopyrrolopyrrole, & BDT.

### **Techniques:**

- Ice-templating\Freeze-drying techniques
- Have a hand-on experience on OFET device fabrication and testing

**Purification techniques:** Column chromatography; liquid-liquid separation, precipitation techniques, recrystallization techniques.

**Analysis:** CIE plot, kinetics experiments, 3D-plotting, concentration-dependent & time-dependent UV-Vis & PL analysis; Spectral analysis-  $^1\text{H}$  NMR,  $^{13}\text{C}$ -NMR, UV-Vis, PL; Sample preparation & analysis of SEM (E-SEM & FE-SEM), TEM (T-20, T-30), AFM, & Fluorescence microscopic data; thin-film thickness measurement& wire-groove thickness measurement.

**Instruments handling:** Zeta potential, Dynamic light scattering, Surface profilometer, UV-Vis spectrophotometer, photoluminescence spectrophotometer, fluorescence microscope, spin coater.

**Software handling:** GoCIE 1931, TA instruments software, Carl Zeiss-Zen 2012 (blue edition), Texmaker, GaussView 5.0, Mercury 3.9, Mendeley, MobaXterm, Image J, Adobe illustrator-CS5 & CS6, Avagadro, Chem-craft, Origin Lab, Gaussian 8.0, Chem draw 12.0 to 15.0, ACD Labs 12.0,. Gaussian09 software for the computational purpose, and softwares related to technical writing.

**Computer Knowledge:** Basics of computer (MS word, MS Excel, Power point, etc.), LaTeX, Linux.

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## **Publications**

**1. Anup Kumar Singh** and Kothandam Krishnamoorthy\*, Self-assembled Spheres, Flowers, and Fibers from the Same Backbone and Similar Side Chains. *Langmuir* 2017, 33, 46, 13401-13406. <https://dx.doi.org/10.1021/acs.langmuir.7b02728>.

**2. Anup Kumar Singh\***, Highly Efficient Method of Utilizing Waste Silica Hazards. Process Safety and Environmental Protection. 2021, 153, 239-248. <https://doi.org/10.1016/j.psep.2021.07.007>.

3. Vediappan Sudhakar\*, **Anup Kumar Singh**, and Mrinmoy Kumar Chini\*, Nano Porous Reduced Graphene Oxide and Polymer Composites as Efficient Counter Electrodes in Dye Sensitized Solar Cells. **ACS Appl. Electron. Mater.** 2020, 2, 3, 626-634. <https://dx.doi.org/10.1021/acsaelm.9b00593>.
  4. **Anup Kumar Singh**, Gitanjali Swain, and Kothandam Krishnamoorthy, Self-assembled Microparticles and their Conversion to Nanoparticles. (Under Review in RSC Soft Matter, **SMART-01-2020-000140**).
  5. **Anup Kumar Singh** and Kothandam Krishnamoorthy, Tunable solid state chromic materials from molecules with same band gap and different band edges. (Manuscript under revision, **NJ-ART-09-2021-004296**).
  6. **Anup Kumar Singh** and Kothandam Krishnamoorthy, Morphology Control in BODIPY-*i*-Indigo network-based Fluorescence microbeads. (Manuscript under preparation).
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## Teaching Experience

Assistant professor (Dec 2021-July 2022) @Udai Pratap College, Varanasi

B.Sc. (sem I & II), B.Sc. 3<sup>rd</sup> year, M.Sc. (sem I, II, III, & IV)

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## Scholastic achievements

- **Reviewership:** ACS Omega (2021, 2022)
  - **Fellowship:** CSIR-UGC Senior Research Fellowship (2016)
  - **Fellowship:** UGC-Junior Research Fellowship (AIR 75, 2014) in Chemical Sciences
  - **Fellowship:** Research Entrance Test [RET] (2013)
  - **Award:** Standing 1<sup>st</sup> position in Class in annual examinations held in April/May-2006
  - **Award:** Awarded slab 'A' certificate for GNIIT offered by NIIT
  - **Award:** Certified as “District Child Scientist” for attending 2<sup>nd</sup> position in Science Exhibition organised by Nehru Children’s Science Exhibition”-06
  - **Award:** Certified as “Zonal Child Scientist” for attending 2<sup>nd</sup> position in Science Exhibition organised by Nehru Children’s Science Exhibition”-06
  - **Award:** Certified as “Child Scientist” at District level by National Children’s Science Congress(NCSC) ,U.P.-Oct, 06
  - **Award:** Certified as “Child Scientist” at Regional level by ”National Children’s Science Congress(NCSC)”,U.P.-Oct, 06/07
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## Hobby

Table Tennis

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## Personal profile

**Name:** Dr. Anup Kumar Singh

**Father's Name:** Sri Bhanu Pratap Singh

**Date of Birth:** April 27<sup>th</sup>, 1988

**Marital Status:** Married

**Nationality:** Indian

**Permanent Address:** Vill. & Post- Basantpur, Thana-Sukhpura, Ballia (U.P.)

**Contact No.:** 9307137733

**E-mail ID:** anupsinghbhu@gmail.com

**Languages known:** Hindi, English, Bhojpuri, partially (Marathi and Bengali).

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## References

### **Dr. K. Krishnamoorthy (PhD Supervisor)**

Principal Scientist

Polymer Science and Engineering Division

CSIR-National Chemical Laboratory

Dr. Homi Bhabha Road, Pune-411008,

Maharashtra India Tel: 020-2590-3075

Email: k.krishnamoorthy@ncl.res.in

### **Dr. N. P. Singh (Head, Chemistry, U. P. College)**

Associate Professor & Head of Department

Department of Chemistry

Udai Pratap (autonomous) College,

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