

Master Thesis at Helmholtz Center in Munich:

Keywords: Nanomaterial Synthesis, Laboratory Automation

Where?

Helmholtz Munich, Ingolstädter Landstraße 1, 85764 Neuherberg, Germany

When?

As soon as possible

Who are we looking for?

We are seeking a motivated and independent student with a strong background in chemistry who is eager to develop and lead their own research project. The candidate should have a keen interest in nanoparticle chemistry and the automation and streamlining of laboratory processes. Proficiency in English and basic programming skills, ideally in Python, are required. The thesis will be supervised by Moritz Schepp (moritz.schepp@helmholtz-munich.de) in the nanoPROBE Lab, led by Jian Cui PhD (jian.cui@helmholtz-munich.de), TUM Junior Fellow in Chemistry/Bioscience.

Contact:

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Preliminary Project Title: "Development and Automation of a Highly Sensitive Plasmonic Nanosensor Platform"

Project Objective

The primary objective of this project is to automate the synthesis of plasmonic silver decahedral nanoparticles (AgDNP), intended for use as biomolecular sensors, using a liquid handling robot. After gaining familiarity with the "manual" synthesis process a parameter optimization study will be conducted to achieve near-unity reaction yields, as reported in literature.¹ The key focus is to implement and streamline the photo-mediated reaction within the automated liquid handling system. Once automation is successfully established, its performance will be compared to the manual synthesis.

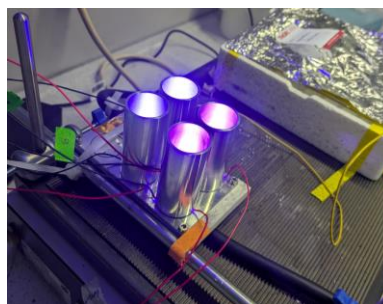
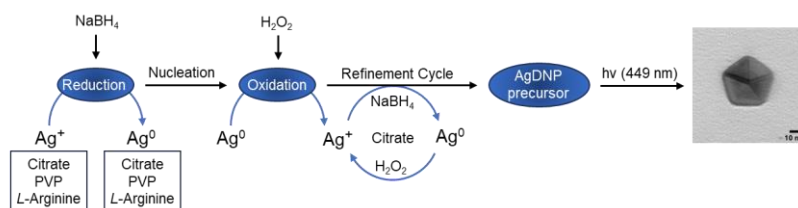


Figure 1: (Top) Schematic representation of photochemical AgDNP synthesis with electron micrograph of single AgDNP. (Bottom left) Tecan liquid handling robot, to be utilized for automating the light-mediated AgDNP synthesis. (Bottom right) Home-built nanoparticle photoreactor, currently in operation, featuring an integrated liquid cooling system.

1. Murshid, N., Keogh, D. & Kitaev, V. Optimized Synthetic Protocols for Preparation of Versatile Plasmonic Platform Based on Silver Nanoparticles with Pentagonal Symmetries. *Particle & Particle Systems Characterization* 31, 178–189 (2014).