

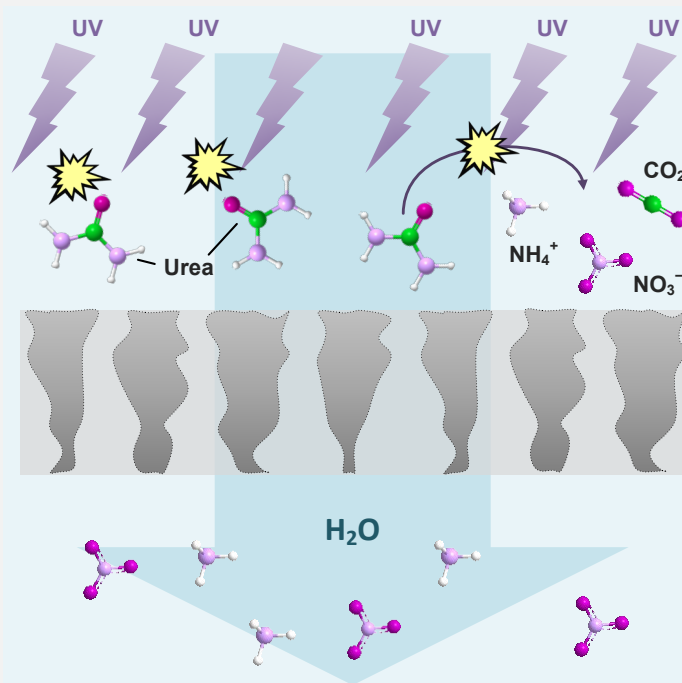
Project Summary

Urea degradation via membrane photolysis

Urea is a problem in the production of ultrapure water required in semiconductor manufacturing, as well as in the treatment of swimming pool water. Urea is a small molecule and physical retention is difficult, while photodegradation is a suitable alternative, where reactive species are produced by light and a catalyst that then break the N-H and C-N bonds of urea.

This project will evaluate the efficiency of urea degradation under UV irradiation in continuous flow through a membrane. A systematic investigation will be conducted by varying UV light parameters (wavelength and intensity) as well as flow conditions (flux i.e. hydraulic residence time).

Urea concentrations will be measured with liquid chromatography – organic carbon detection (LC-OCD) instrument available at KIT-IAMT. Optics expertise will be provided by collaborators at IMT-KIT, if required.



The following tasks will be performed by the Master's student;

- Literature review (fundamental and applied knowledge in semiconductor industry requirements, photocatalysis and photolysis, urea removal, LC-OCD, etc.);
- Operation of photolytic filtration experiments and urea analysis with LC-OCD;
- UV-Vis analysis of membranes and evaluation of membrane photostability;
- Data analysis and, if suitable, contribution to the preparation of a research publication.

Besides, the student will be participating in group activities and writing of reports and take part in collaborative discussions with colleagues from KIT-IAMT and other institutes. Language of all communications and writing will be English.

Required Skills

Current enrolment in a Master in Chemical/Process Engineering or equiv. (Uni., TH)

Good knowledge in chemistry and membrane technology; proactive in learning; evidenced writing skills in English language; ability to use MS Word, Excel; willingness to acquire proficiency in Origin Labs and MS Visio software for data analysis and graphing, and Endnote for citation mgmt; interest in the possibility to contribute scientifically to the writing of a scientific publication.

Institute/ Department

Institute for Advanced Membrane Technology (IAMT), Bldg. 352, Campus North, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany for information on team, research skills and research environment: <https://www.iamt.kit.edu/>

Start Date

Flexible/Negotiable. Duration at least 6 months.

Application Procedure

Please email CV, transcripts and motivation letter with available time period for evaluation. For external applicants please provide details of the local supervisor.

Project Advisor(s)

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