UniSysCat-Colloquium

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Start Time: Wednesday, June 26, 2024 05:15 pm

End Time: Wednesday, June 26, 2024 06:30 pm

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or via Zoom

Reticular Chemistry: From Covalent Organic Frameworks (COFs) to Porous Crystalline Nitrogen Doped Graphite

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Covalent Organic Frameworks (COFs) represent a new class of highly porous, crystalline polymers with uniformly arranged ordered pore channels. Even though COFs have been used for the storage of a wide variety of molecular species like gases, nanoparticles, enzymes, and drugs, the benefits of their ordered pore channels for molecular separation are hardly extracted. The key issue behind this problem is fabricating COF particles into a self-standing, stable membrane form. Apart from the processibility, the other formidable obstacles preventing the utilization of COFs in real-life applications are i) chemical stability, ii) complicated synthetic procedures, and iii) scalability. In this context, we have successfully overcome the chemical stability problem of COFs, by synthesizing β-*ketoenamine* based frameworks. Irreversible enol to keto tautomerism resulted in exceptional stability within the frameworks. While processability, synthetic hurdles, and scalability of COFs remain unexplored. To address these critical issues, we have developed a straightforward, scalable, and novel methodology by which COFs can be synthesized by simple mixing and heating of the reactants. Using this method, COF can be processed into self-standing covalent organic framework membranes (COMs). In the last part of this talk, I would like to discuss the creation of porous nitrogen-doped graphite. Here, I would like to showcase a novel one-pot, metal-free synthetic approach for creating nitrogen-doped graphite, addressing the limitations of traditional methods.

Prof. Dr. Arne Thomas

Organizer