


Abstract

# Hemicucurbituril-Porphyrin Supramolecular Systems for Pollutant Sensing and Remediation <sup>†</sup>

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<sup>\*</sup> Correspondence: riina.aav@taltech.ee<sup>†</sup> Presented at the International Conference EcoBalt 2023 “Chemicals & Environment”, Tallinn, Estonia, 9–11 October 2023.**Keywords:** chiral receptor; pollutant; sensing; absorption; supramolecular systems

Hemicucurbiturils are members of the single-bridged cucurbituril family, formed through templated synthesis in a single step. This class of compounds is known for its ability to form inclusion complexes with electron-rich species. We have developed sustainable synthesis methods for chiral hemicucurbit[n]urils (where n = 6 or 8) and their derivatives [1–4]. Additionally, we have demonstrated that cyclohexanohemicucurbiturils can form external complexes with metalloporphyrins [5]. Porphyrins are well known for their optical and photochemical properties, which are extensively utilized in sensing and catalysis applications. Chirality sensing adds another viewpoint to sensing systems, and we have shown that toxic organocatalysts can be sensed via complex formation with Zn porphyrins [6]. By merging chiral hemicucurbiturils and metalloporphyrins via non-covalent interactions into a solid thin material, one can construct an enantioselective electronic nose and very selectively discriminate different analytes and their handedness [7]. In this conference, we will present our findings on how hemicucurbiturils and porphyrins, as supramolecular receptors, can be employed for optical and gravimetric sensing, as well as for the remediation of chemical pollutants.

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