CHIRAL HEMICUCURBIT[*n*]URILS, THEIR SYNTHESIS, POST FUNCTIONALIZATION AND APPLICATION

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Supramolecular chemistry involving encapsulation of guest molecules by macrocyclic hosts, has become a challenging interdisciplinary field with a wide range of applications and a strong impact in analytical sciences. Hemicucurbiturils (HCs)[1] are neutral macrocyclic host molecules which is a subclass of cucurbiturils (CBs), well known pumpkin shaped host molecules synthesized in template controlled single step oligomerization reaction.[2] In the CB family, there aren't many examples of chiral hosts, which is a significant disadvantage. In this work we address various methods for inducing chirality in CB-type hosts,[3] and discuss the synthesis of cycHC[12] which is the largest substituted HC homolog to date.[4] An efficient mechanochemical protocol is developed to assist in tuning of macrocyclic structure as well as for synthesis of peptides and amides.[5] We also show that cycHCs can bind neutral heterocycles and that sulfur-containing heterocycles can be efficiently isolated from water using solid-phase extraction.[6]

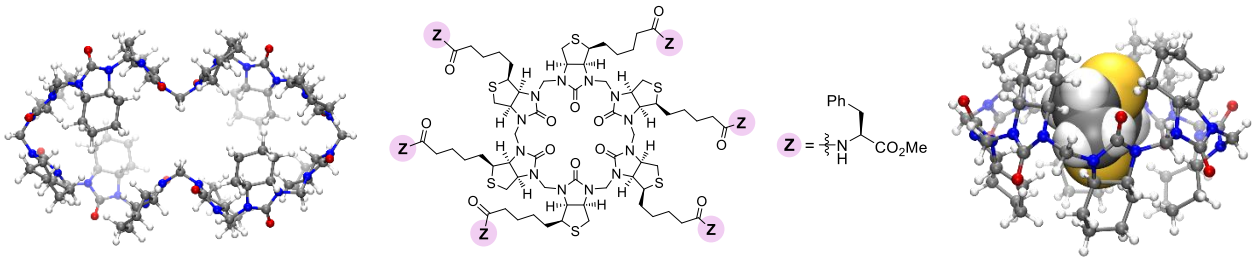

Figure 1. From left to right: cycHC[12]; hexa-amide-biotin[6]uril; and 1,3-dithiolane@cycHC[8]

References

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