

# Controlled conformational switching of deep cavitands based on calix[4]pyrrole scaffolds

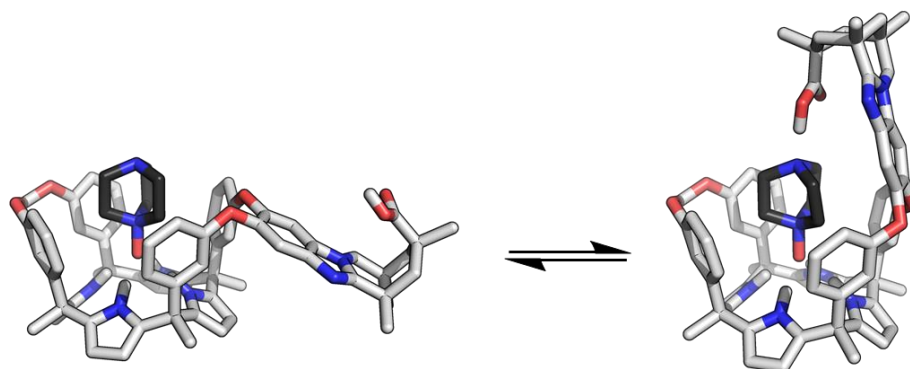
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Calix[4]pyrroles are tetrapyrrolic macrocyclic compounds known to act as effective receptors for anions, ion-pairs and electron rich neutral compounds. The incorporation of aryl substituents in each of the four meso positions of the calix[4]pyrrole core affords aryl-extended calix[4]pyrroles (AE-C4P) featuring a deep polar aromatic cavity closed at one end by the converging pyrrole NHs. The synthetic strategies used in the preparation of deep cavitands previously reported for resorcin[4]arene were applied to further elaborate the aromatic cavity of AE-C4P. Whereas resorcinarene-based cavitands easily switch between the vase and the kite conformations, the calix[4]pyrrole-derived cavitands are conformationally more rigid than their resorcinarene analogues. The results obtained so far suggested a remarkable preference toward the kite-like conformation both in free and bound calix[4]pyrrole-based cavitands.<sup>1</sup> We did not observe any evidences of switching from kite-like to vase-like conformation. In the present work we propose two alternative strategies to promote this conformational switching: 1) the incorporation of an additional binding site on the aromatic panel that can interact with the bound guest (e.g. pyridine N-oxide derivatives) and stabilize the vase-like conformation (Figure 1) and b) the replacement of the phenyl panel by a pyrazine aiming at reducing the steric hindrance of the vase-like conformation. We report the synthesis, structural characterization and conformational features of the new calix[4]pyrrole deep cavitands in organic solution.



## References:

1. Galán, A.; Escudero-Adán, E. C.; Frontera, A.; Ballester, P. *J. Org. Chem.* **2014**, 79 (12), 5545–5557.