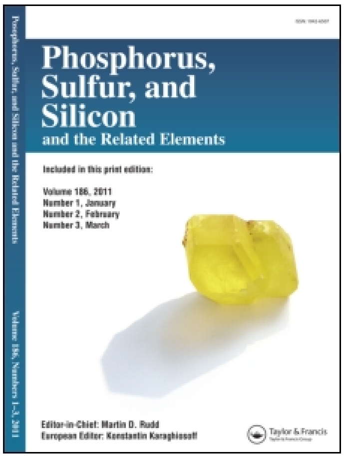


Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Synthesis and Complexing Properties of Novel Tetraphosphonate-Calix[4] Resorcinarenes

Brigitte Bibal[a]; Pascale Delangle[a]; Jean-Christophe Mulatier[a]; Jean-Pierre Dutasta[a]
[a] Stéréochimie et Interactions Moléculaires, UMR CNRS 117, LYON Cedex 07, FRANCE

To cite this Article Bibal, Brigitte , Delangle, Pascale , Mulatier, Jean-Christophe and Dutasta, Jean-Pierre(1999) 'Synthesis and Complexing Properties of Novel Tetraphosphonate-Calix[4] Resorcinarenes', Phosphorus, Sulfur, and Silicon and the Related Elements, 147: 1, 29 — 30

To link to this Article: DOI: 10.1080/10426509908053495

URL: http://dx.doi.org/10.1080/10426509908053495

Phosphorus, Sulfur and Silicon, 1999, Vol. 147, pp. 29-30
Reprints available directly from the publisher
Photocopying permitted by license only

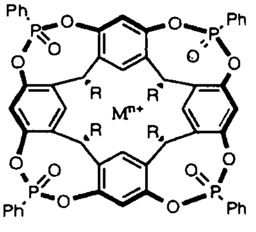
Published by license under the
Gordon and Breach Science Publishers imprint.
Printed in Malaysia

Synthesis and Complexing Properties of Novel Tetraphosphonate-Calix[4]Resorcinarenes

BRIGITTE BIBAL, PASCALE DELANGLE,
JEAN-CHRISTOPHE MULATIER and JEAN-PIERRE DUTASTA

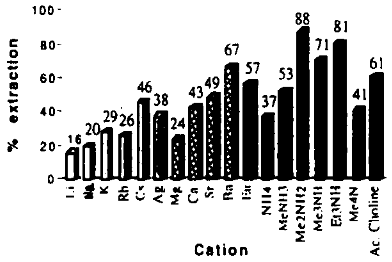
Stéréochimie et Interactions Moléculaires, UMR CNRS 117, École Normale Supérieure de Lyon, 46 allée d'Italie, 69364 LYON Cedex 07, FRANCE

We recently reported the synthesis of phosphorylated cavitands and their high affinity for cationic species.[1] We have thus synthesized and explored the properties of novel phosphacavitands containing four long R chain substituents at their lower rim. The amphiphilic molecule **2** could be introduced into a micelle. The compounds **3** and **4** could be used respectively as a cation carrier into Supported Liquid Membrane and as a sensor into a Self-Assembled Monolayer on gold.[2, 3]



1 : R = $-(CH_2)_2Ph$
2 : R = n-$C_{11}H_{23}$
3 : R = $-(CH_2)_7-O-C_6H_4NO_2$
4 : R = $-(CH_2)_{10}-S-(CH_2)_9CH_3$

Extraction studies of the cavitand 2



The complexing properties of ligands **1** - **4** for M^{n+} metallic cations (n= 1-3) and ammonium cations have been characterized by extraction experiments.[4] We found that these cavitands are better extractants of methylammonium cations (50-90%) than metallic cations except for Cs^+, Ba^{2+} and Eu^{3+}. The free energies of association for alkali cations are in the range 40-50 kJ/mol, with a maximum for Cs^+.

The structural aspects (NMR and X-ray data) of the supramolecular complexes obtained with cesium and methylammonium picrates reveal that the guests are deeply encapsulated into the cavity defined by the aromatic rings and the phosphoryl moieties of the ligands.

The remarkable effect of the counterion (Cl^-) coordination has to be investigated.

References

[1] Delangle, P. ; Mulatier, J.-C. ; Dutasta. J.-P. *ISMR19* **1998,** Klewer Academic, under press.

[2] Reinchwein-Buitenhuis, E. G. : Visser. H. C. ; Reinhoudt. D. N. *J. Am. Chem. Soc.* **1995,** *117,* 3913.

[3] Reinhoudt, D. N. et al. *J. Am. Chem. Soc.* **1995,** *117,* 6853.

[4] Arnaud-Neu, F. et al. *J. Incl. Phenom.* **1991,** *10,* 329. Cram. D. J. et al. *J. Am. Chem. Soc.* **1979,** *101,* 4928.