

THE SOLID STATE COMPLEXES OF PHENANTHROLINE WITH ANIONIC CALIX[N]ARENES.

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1,10-Phenanthroline is a well-known supramolecular building block and bidentate chelating ligand. It is also an excellent aromatic nitrogen containing supramolecular synthon in crystal engineering for the study the role of aromatic π - π stacking and hydrogen bonding in design and construction of supramolecular assemblies. It can function as a photosensitizer and as intercalating agent with DNA and RNA. There exists a considerable interest in constructing supramolecular arrays of *para*-sulphonato- and *para*-sulphonato-thia-calix[*n*]arenes with 1,10-phenanthroline in the presence of different metal salts¹⁻⁵. However, there are also reports on the interactions involved between *para*-sulphonatocalix[*n*]arenes and 1,10-phenanthroline in the absence of metal ions which may provide input for the design of new solid-state complexes⁶⁻⁸.

For the investigations were used different types of hosts molecules. *para*-Sulfonatocalix[8,6]arenes which has a bigger and more flexible cavity than calix[4]arene and then is able to adopt more than one guest molecule, it possesses eight negative charged sulphonate groups. *para*-Sulfonatocalix[4]arene with its small cavity and four sulphonate groups. Calix[4]arene dimethoxycarboxylic acid possesses small cavity and two negative charged carboxyl groups, which is similar to calix[4]arene dihydroxyphosphonic acid. Such diversity of host molecules allows to obtain different stoichiometry of supramolecular complexes.

Here, we want to present two new solid state structures of inclusion complexes of phenanthroline with *para*-sulphonatocalix[8]arene and calix[4]arene dimethoxycarboxylic acid. The phenanthroline cations are involved both in inclusion and also in various assemblies formed by aromatic–aromatic stacking.

1. Y. Liu, D.-S. Guo, H.-Y. Zhang, S. Kang and H.-B. Song, *Cryst. Growth Des.*, 2006, 6, 1399–1406.
2. P. J. Nichols, C. L. Raston and J. W. Steed, *Chem. Commun.*, 2001, 1062–1063.
3. C. Liu, F. Luo, W. Liao, D. Li, X. Wang and R. Dronskowski, *Cryst. Growth Des.*, 2007, 7, 2282–2285.
4. C. Liu, F. Luo, Y. Bi, W. Liao and H. Zhang, *J. Mol. Struct.*, 2008, 888, 313–317.
5. Y. Liu, Y. Bi, W. He, X. Wang, W. Liao and H. Zhang, *J. Mol. Struct.*, 2009, 919, 235–238.
6. Y. Liu, D.-S. Guo, H.-Y. Zhang, F. Ding, K. Chen and H.-B. Song, *Chem.–Eur. J.*, 2007, 13, 466–472.
7. A. N. Lazar, A. Navaza and A. W. Coleman, *Chem. Commun.*, 2004, 1052–1054.
8. B. Leśniewska, O. Danylyuk, K. Suwińska, T. Wojciechowski, A. W. Coleman, *CrystEngComm.*, 2011 13, 3265–3272.