

Binding Ability of Carbazolylphenyl Dendrimers with Zinc (II) Tetraphenylporphyrin Core towards Cryptands

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Abstract : The processes of complexation of the Zn-tetraarylporphyrins with eight 4-(4-(3,6-bis(t-butyl)carbazol-9-ylphenyl)-1,2,3-triazole (ZnP1) and eight 4-(4-(3,6-di-tert-butyl-9-H-carbazol-9-yl)phenoxy)methyl)-2,4,6-trimethylphenyl (ZnP2) with the 1,10-diaza-4,7,13,18-tetraoxabicyclo[8.5.5]eicosane (L1), 1,10-diaza-4,7,13,16,21,24-hexaoxabicyclo[8.8.8]hexacosane (L2) and 1,10-diaza-5,6,14,15-dibenzo-4,7,13,16,21,24-hexaoxabicyclo[8.8.8]hexacosane (L3) were investigated by the method of spectrophotometric titration and ¹H NMR-spectroscopy. We determined the structures of the host-guest complexes, and their stability constants in toluene were calculated. It was found out that the ZnP1 interacts with the guest molecules L1, L2 with the formation of stable "nest" type complexes and does not form similar complexes with the L3 (presumably due to the fact that the L3 does not match the size of the porphyrin ZnP1 cavity). On the other hand, the porphyrin ZnP2 binds all of the ligands L1-L3, however complexes thus formed are less stable than complexes ZnP1-L1, ZnP1-L2. In the report, we will also discuss the influence of the alkali cations additives on the stability of the complexes between the porphyrin ZnP1, ZnP2 hosts and guest molecules of the ligands L1-L3.

Keywords : porphyrin, cryptand, cation, complex guest-host

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