Makrocykle i klatki wywodzące się z diamin = Macrocycles and cages derived from diamines

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Streszczenie

Condensation of diamines with dialdehydes leads to macrocyclic imines. Similarly, the reaction of diamines with tri- or tetraaldehydes can lead to the formation of molecular cages. These imine products form a variety of metal complexes with interesting architectures. In the case of chiral diamines, such as trans1,2-diaminocyclohexane (DACH), enantiopure macrocycles or cages can be obtained. This article will discuss selected examples of such systems. The reaction of diamines with 2,6-diformylpyridine templated by lanthanide(III) salts results in the formation of stable lanthanide complexes of [2+2] macrocycles. These Ln(III) macrocyclic units can be linked via additional bridging ligands to form doubledecker, triple-decker or polymeric systems with interesting magnetic properties. The enantiopure [3+3] imine macrocycles derived from DACH and 2,6-diformylphenols form metal-organic cages with Zn(II) and Co(II) ions which exhibit gas sorption properties and enantioselective binding of guest molecules. The corresponding [3+3] amine macrocycles form dinuclear, trinuclear and tetranuclear complexes with lanthanide and transition metal ions. On the other hand, the very large [6+6] macrocycle containing 18 nitrogen atoms is predisposed to form hexanuclear complexes with Cu(II) and Ni(II) ions. While condensation of DACH with 1,3,5triformylbenzene results in the formation of [4+6] imine cage, condensation of diamines with 1,3,5-triformylphloroglucinol leads to the formation [2+3] ketoenamine cages. In turn, condensation of DACH with extended aromatic tetraaldehydes leads to the formation of [3+6] cages.

Słowa kluczowe

macrocycles, cages, imines, metal complexes, chirality

makrocykle, klatki, iminy, kompleksy metali, chiralność