Desigh of multifunctional macrocyclic compounds.

Sheyda Mammadova[1], Ilgar Mamedov[1], Hermann A. Mayer[1]

[1]Institute of Inorganic Chemistry, University of Tuebingen,Tuebingen,, Germany

Introduction. Metal complexes of the ligands derived from 1,4,7,10-tetraazacyclododecane (Cyclen) are highly interesting for different fields of chemistry, material science, biology and medicine. A variety of applications impose certain restrictions on the properties of the complexes. We have developed a reaction scheme which allows to access highly versatile multifunctional macrocyclic compounds for different kinds of applications Fig.1. The presences of the amino group in the side chain of the macrocycle allows to add phosponates, carboxylic acids and fluorescence groups. Choise of the functional groups dependent on the further application of the compounds (optical or MR imaging,…). The additional nitro group on the benzyl ring of the side chain can be reduced to conjugate the corresponding molecule with different polymers and supports.

Synthesis of the ligands. Synthesis has been done in nine steps, including reactions of esterification, reduction of esters to alcohol, bromination of alcohols, protection of the amino groups, alcylation of macrocycle, deprotection of Boc and t-Butyl- groups, complexation with the metals. Cyclen and L-phenylalanine were used as starting materials. The complexation with metals have been achieved according to well known literature procedures.

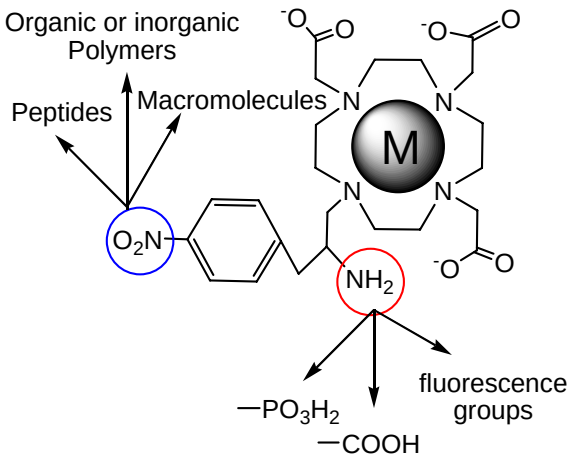

Figure 1 Multifunctional macrocyclic compound