

Abstract

Complexes of metal ions with derivatives of 1,4,7,10-tetraazacyclododecane (cyclen) are used in various applications, such as contrast agents for magnetic resonance imaging (MRI). The structure of ligands affects the thermodynamic, kinetic, and relaxation properties of the complexes. The unsymmetrically substituted monoamide DO3AP is particularly interesting from this perspective. Synthesis of non-symmetrically substituted cyclen derivatives requires the use of orthogonal protection of cyclen. With intention to synthesize monoamide DO3AP, this thesis presents the preparation of a monoprotected cyclen, two types of orthogonal protection of cyclen, and a substitution of the protected cyclen with acetate pendant arms.

Key words:

Complexes, ligands, macrocycles, protection groups, synthesis