SYNTHESES OF NEW AZACYCLOPHANES AS MODEL COMPOUND OF ENZYME

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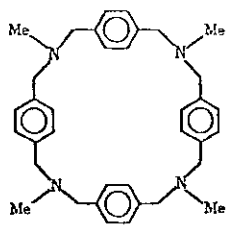
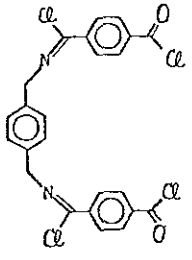
Previously, we have reported the preparations and enzyme-like properties of N,N',N'',N'''-tetramethyl-2,11,20,29-tetraaza[3.3.3.3]paracyclophane(1) and its octamethyl-tetraammonium derivative.

Now we report the preparations of such heterocyclophanes as N,N'-dimethyl-2,11,20,29-tetraaza[3.3.3.3]paracyclophane(4) as the enzyme model. This heterocyclophane has two secondary amino groups at the fixed position and, therefore, provides a better model of enzyme by introducing an appropriate catalytic group into the secondary amino group. Dicarboxylic acid chloride(2) was subjected to cyclization with N,N'-dimethyl-p-xylylenediamine in benzene over a 8hr period under refluxing by means of high dillution technique. Silica gel chromatography followed by recrystallization afforded N,N'-dimethyl-2,11,20,29-tetraaza[3.3.3.3]paracyclophane-3,10,21,28-tetraone(3) in 17% yield. Lithium aluminum hydride reduction of the tetraamide(3) in dioxane afforded N,N'-Bis(p-N-methylaminomethylxylyl)-N,N'-dimethyl-p-xylylene diamine was synthesized as a precursor which is to be condensed with a variety of appropriate dicarboxylic acid chlorides give new types of functionalized azacyclophanes.



(1)



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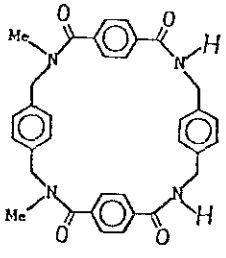

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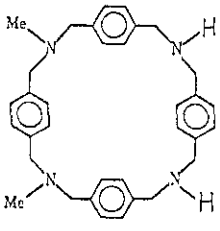

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