

Calixarene Tubes Bearing Anchoring Groups

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First reported in 1997, calix[4]tubes have a unique selectivity for potassium cation and can be used as simulators for ion channels. Modifications of calixarene tubes have been poorly developed before our recent work, where we have proposed the functionalization approach that utilized substituted adamantane residues as key moieties. The method has allowed to synthesize numerous functional derivatives of calix[4]tubes and to expand the field of their application.¹

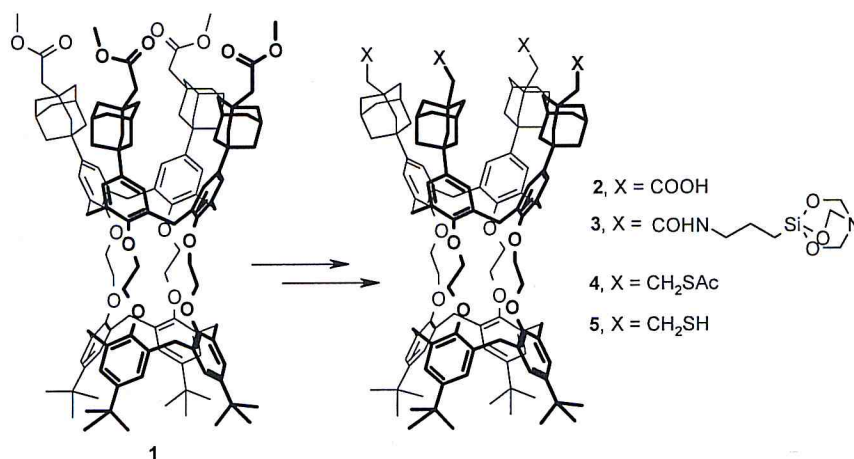


Figure 1. introduction of anchoring groups into calix[4]tubes.

Here we used calixarene tube **1** containing four ester groups as a precursor for preparation of compounds bearing anchoring units (Figure 1). The tetra-ester **1** was converted into tetra-acid **2**, which was activated and treated with aminopropylsilatrane. As a result, calixtube **3** containing four silatrane groups was prepared. By reduction of tetra-ester **1** followed by treating with thioacetic acid, calixtube **4** having four thioacetate functionalities were prepared and then converted into tetrathiol **5**. Formation of thin-films by carboxyl- (**2**), silatrane- (**3**) and thiol-containing (**5**) calixtubes were studied at oxide (e.g. SiO₂, for **2**, **3**) or gold surfaces (for **5**).

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