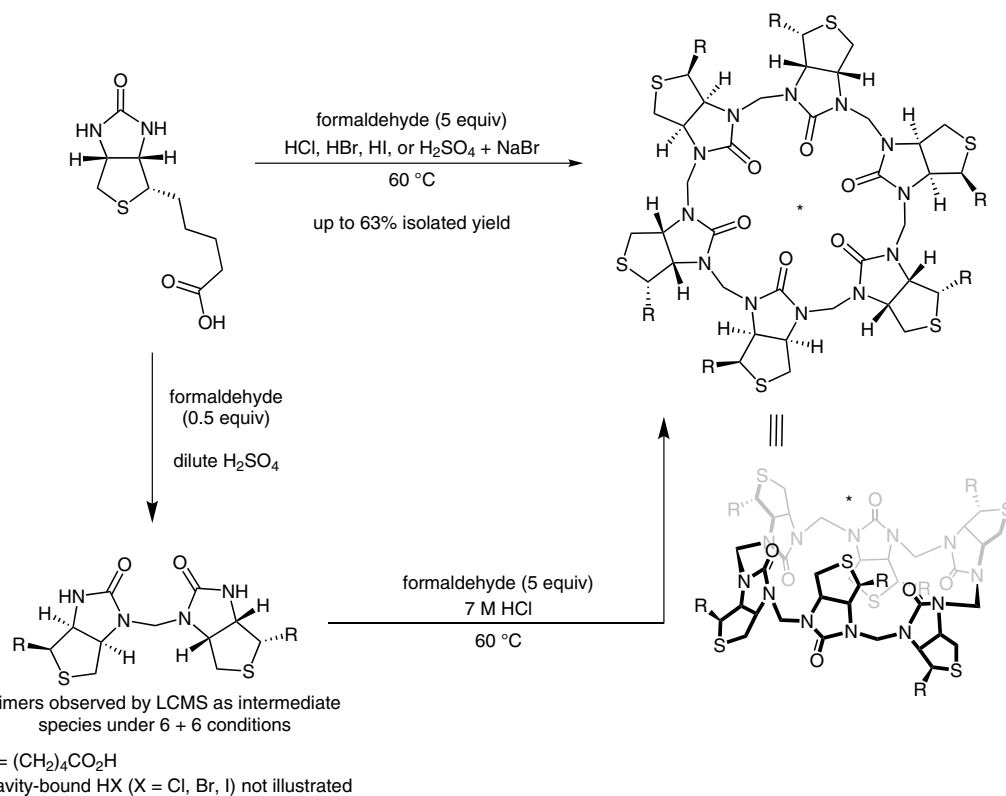


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M. LISBJERG, B. M. JESSEN, B. RASMUSSEN, B. E. NIELSEN, A. Ø. MADSEN,
M. PITTELKOW* (UNIVERSITY OF COPENHAGEN, DENMARK)
Discovery of a Cyclic 6 + 6 Hexamer of D-Biotin and Formaldehyde
Chem. Sci. **2014**, *5*, 2647–2650.

Get Your Biotin Kicks on Route 6+6



Significance: Cucurbiturils and hemicucurbiturils have been studied as molecular receptors. Pittelkow and co-workers report the synthesis of a new hemicucurbit[6]uril from acid-catalyzed, halide-templated, regioselective condensation of biotin and formaldehyde. Halide binding constants for this cavitant, spanning about two orders of magnitude, are determined by titration experiments using NMR spectroscopy and isothermal titration calorimetry. A procedure to isolate halide-free cavitant is also presented, opening up the potential for future binding studies on chiral guests.

Comment: It is remarkable that of the nine possible regioisomers, only the alternating hexamer is observed. The thioether and carboxylic acid moieties of the biotin-formaldehyde hexamer hold potential for binding metal clusters/surfaces. Curiously, although the cavitant is found to bind iodide more strongly than chloride or bromide, the optimized conditions for 6+6 cyclocondensation use sodium bromide.

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Category

Synthesis of
Materials and
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Key words

cavitands

host-guest
chemistry

template synthesis

regioselectivity