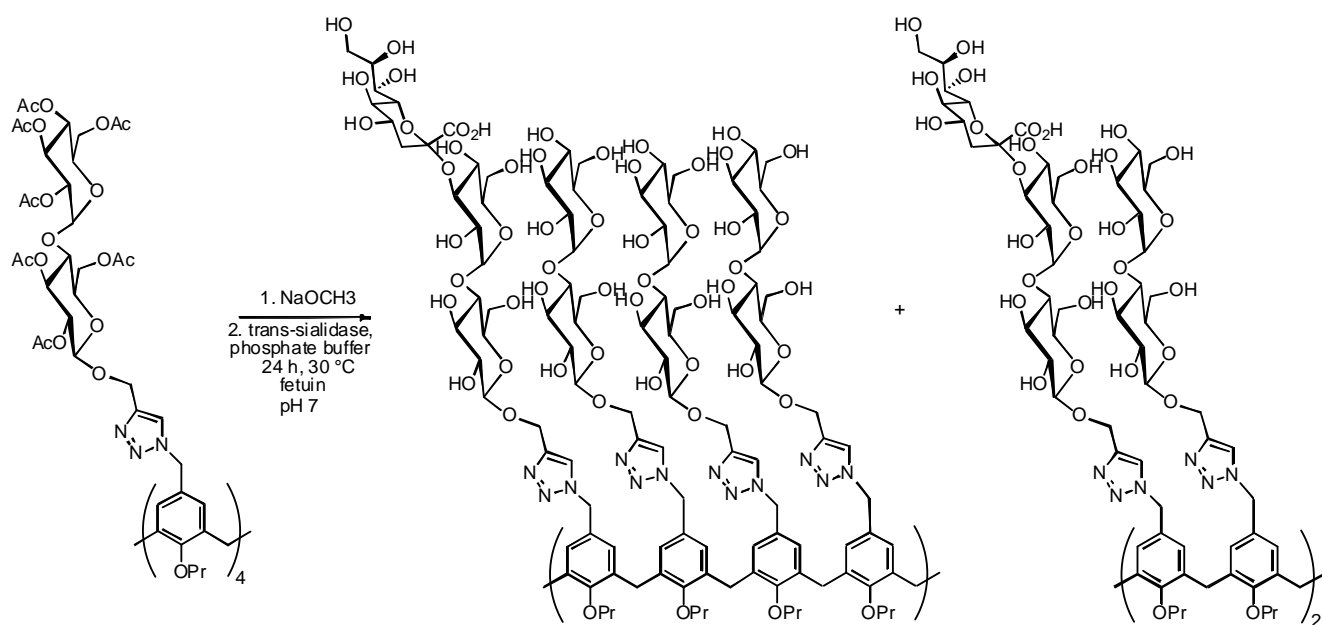


## 8.6 Dr S P Bew, School of Chemical Sciences, University of East Anglia Hybrid Calixarenes

During 2007 an aim of one of our research projects was the synthesis of a "hybrid calixarene". That is a calix[4]arene that has appended onto it a series of functional groups that are fully amenable to the introduction of secondary, different substituents attached to each other *via* a covalent bond. We wanted to undertake the appendage of the second substituent (onto the upper-rim,) using an enzymatic biotransformation; this had not been previously reported. Towards this goal we reported in 2007 in *Organic Letters* the first application of "click" chemistry to the upper-rim of a calix[4]arene for the synthesis of  $\alpha$ -amino acid and carbohydrate derived calix[4]arenes.<sup>1</sup>

It was our intention to investigate, again for the first time the potential application of *trans*-sialidase for its ability to chemoselectively append sialic acid onto a carbohydrate derived calix[4]arene. Thus we were delighted to find that *trans*-sialidase did indeed transfer *via* fetuin sialic acid to lactose, indeed using the EPSRC Mass Spectroscopy service we were able to show that the *trans*-sialidase mediated the transfer of only one and two sialic acids onto the upper-rim of the calix[4]arene (*Scheme 1*) that had, previously been appended with four lactose carbohydrates, thus demonstrating the chemo- and regioselectivity of the biotransformation process.



**Scheme 1**

<sup>1</sup>S. P. Bew, R. A. Brimage, Nathalie L'Hermite and Sunil V. Sharma, *Org. Lett.*, **2007**, *9*, 3713