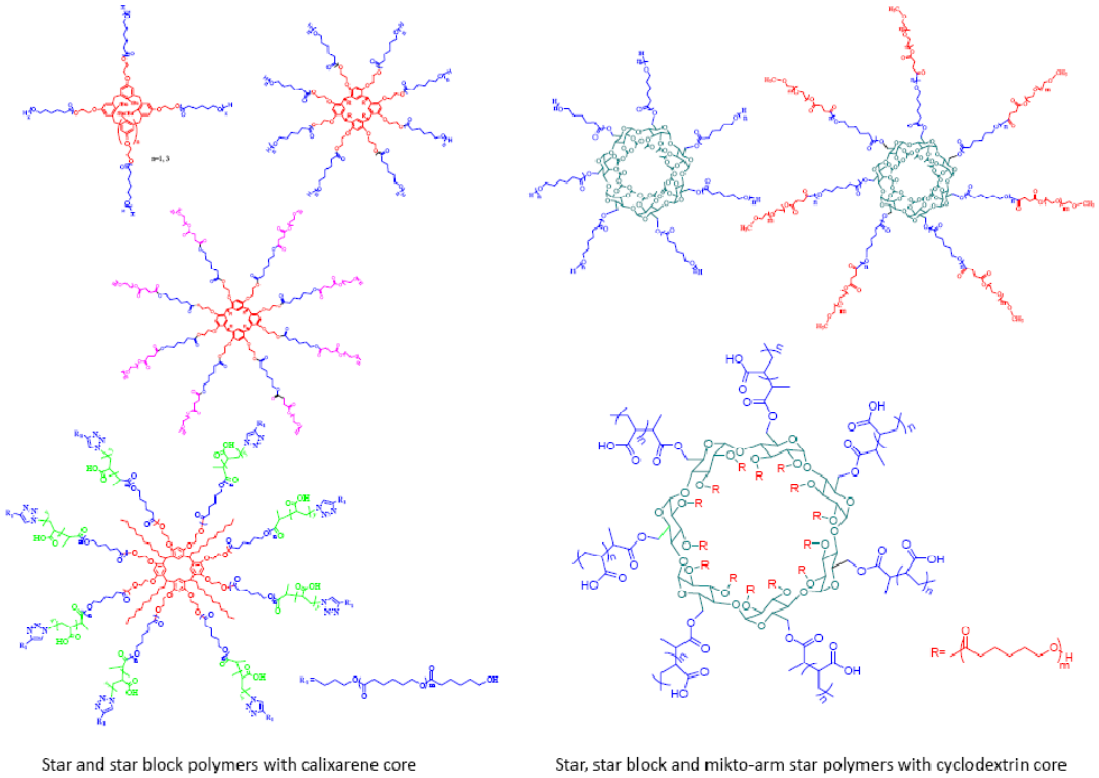
Star Polymers from Calixarene and Cyclodextrin

Weipu Zhu, Pengfei Gou, Zhiquan Shen*
Key Laboratory of Macromolecule Synthesis and Functionalization of Ministry of Education,
Department of Polymer Science and Engineering, Zhejiang University, Hangzhou 310027, P. R. China
e-mail address: zhuwp@zju.edu.cn

Many interests have been paid on the design and synthesis of star polymers because of their unique morphological and physical properties from those of their linear polymer counterparts. [1] Quite a few small molecules with numerous functional groups have been used as core moieties for the preparation of well-defined star polymers by core-first method. Macrocyclic compounds, such as calixarenes and cyclodextrins often provide several functional groups which can be further modified to obtain star-like polymers. A series of polymers with well-defined complex architectures, such as star, star block and mikto-arm star have been synthesized using calixarenes and cyclodextrins as core molecules via the combination of controlled/living polymerization, coupling reaction and “click” chemistry, as shown in Scheme1.



Scheme 1. Chemical structures of star, star block and mikto-arm star polymers from calixarene and cyclodextrin core

[1] Hadjichristidis, N.; Pitsikalis, M.; Pispas, S.; Iatrou, H. Chem Rev 2001, 101, 3747-3792.