Research project for PhD student from China Scholarship Council

« Flow synthesis of halogen-bond polymers »

Affiliation

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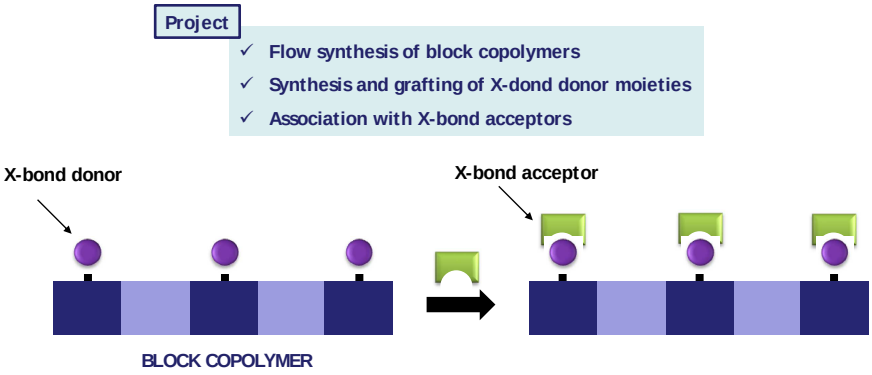
Description

The synthesis of structurally well-defined functionalized polymers by precise control of molecular weight and molecular weight distribution, selective end-functionalization, and highly controlled block copolymerization has caught significant attention. Alternatively to conventional synthetic tools, the concept of flash chemistry, in which extremely fast reactions are controlled by means of microflow systems has appeared as an attractive path. Based on this concept, flow-microreactor-system-controlled polymerization (anionic, cationic and radical) has been successfully developed.[1–3]

On another hand, halogen bonding (X-bonding) is the noncovalent interaction between electrophilic halogen substituents and Lewis bases.[4] It is similar to hydrogen bond (H-bond) by many aspects (unidirectional, similar strength) with the advantadge of being less sensitive to acidity of the medium.[5] Whereas X-bond has received only few attention in previous decades it has re-emerged since the 1990s as a reliable motif for crystal engineering.[6] ***The presence of X-bond donor (XBD) blocks on polymeric materials would thus be very attractive to modify their properties.***

The goal of the project is to use microfluidic technology to access perfectly-defined polymers bearing XBD moieties. These novel polymers could be used for various purposes such as the formation of interpolymer complexes[7] or trapping of chemical agents.[8]



References:

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Keywords

polymer, supramolecular chemistry, halogen-bond, microfluidics

Applicant profile

The project requires strong skills in: organic synthesis and macromolecular chemistry; characterizations of polymer.

The applicant will be expected to have a good level in English or French.