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Interfacial engineering using heteropolymers with adjustable monomer sequences (HAMS)[1]

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Heteropolymers with adjustable monomer sequences (HAMS) represent a new type of functional random copolymers that could play an important role in emerging areas pertaining to interfacial science and polymer assembly. Due to their disordered but tailorable co-monomer sequence distribution HAMS are capable of adsorbing selectively at interfaces and recognizing patterns on chemical targets (i.e., chemically patterned substrates). HAMS are synthesized in a laboratory by 'coloring' the segments of a collapsed homopolymer, A, with a functionalizing agent, B, and then unraveling the resultant polymer to yield a random sequence of A and B blocks, which 'remembers' its original collapsed conformation and hence prefers some conformations over others. In the presentation, we will provide details pertaining to the experimental formation of HAMS and studying their physico-chemical characteristics. We will also provide examples of a few case studies that unravel the tailorable interfacial and self-assembly character of HAMS made of poly(styrene-co-4-bromostyrene) and its derivatives. In addition, we present results of computer simulation studies providing molecular insight into forming HAMS.

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