

A facile route for the preparation of azide-terminated polymers. „Clicking“ polyelectrolyte brushes on planar surfaces and nanochannels

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In this work we describe the facile preparation of azide-terminated polymers by conventional radical polymerization (cRP) using azo initiators bearing azide groups. We show that cRP provides a convenient avenue for the preparation of azide end-functional polymers in a one-step process. The versatility of this chemical methodology was demonstrated by the synthesis of unprecedented azide end group-functionalized sodium polystyrene sulfonate (PSSNa) and poly(2-methacryloyloxyethyl-trimethylammonium chloride) (PMETAC) which were then “clicked” onto alkyne-terminated silicon surfaces and polyethylene terephthalate nanochannels to form polyelectrolyte brush layers. The facile synthesis of the end-functionalized macromolecular building blocks will enable the creation of a wide variety of “clickable” architectures using very simple synthetic tools. We are confident that these results will constitute a key element in the “click” chemistry toolbox and, as such, will have strong implications for the molecular design of interfaces using macromolecular architectures.