Nanostructured Antimicrobial Coatings via Polyurethanes having Co-Polyoxetane Soft Blocks.*

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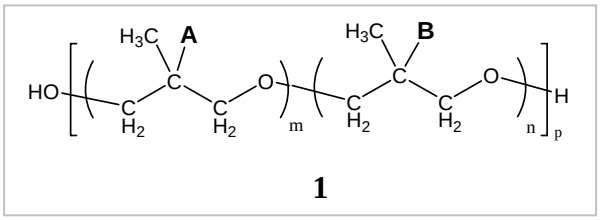
Polyoxetanes are polyethers or formally 2,2'-substituted-1,3-propylene oxides. Co-polyoxetane telechelics **1** may be represented as P(**AB**), where **A** and **B** are repeat units with differing side chains. These telechelics are incorporated into polyurethanes and used as polymer surface modifiers (Figure 1). As an example, polyurethanes were prepared with P(**AB**) soft blocks where **A** = a fluorous "chaperone" or PEG-like side chain and **B** = alkylammonium side chains. At 2 wt % in a conventional polyurethane, two of the surface modifiers effect 100% kill of a 10^7 CFU/ml aerosol challenge of Gram +/- pathogenic bacteria in 30 min. The effectiveness of the new modifiers is due in part to surface nano-topology and spatial distribution of alkylammonium groups mimicking naturally occurring biocidal peptides such as the magainins and cecropins. Recent results concerning disinfection kinetics and ionic exchange will be presented.



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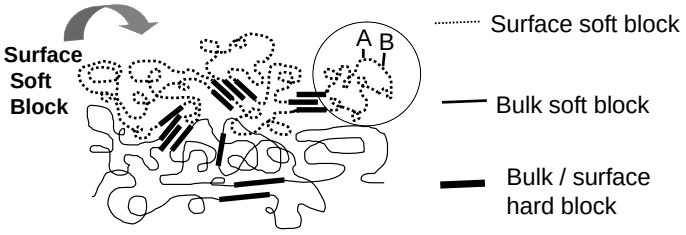

Figure 1. Polyurethane surface modification via a P(**AB**) polyurethane, where **A** and **B** are co-polyoxetane soft block repeat units.

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