An Explanation for the Very Low Friction of Polyelectrolyte Brushes JEFFREY SOKOLOFF, Northeastern University — It is shown using a method based on the mean field theory of Miklavic Marcelja that it should be possible for osmotic pressure due to the counterions associated with the two polyelectrolyte polymer brush coated surfaces to support a reasonable load (i.e., about $10^5 Pa$)with the brushes held sufficiently far apart to prevent entanglement of polymers belonging to the two brushes, thus avoiding what is believed to be the dominant mechanisms for static and dry friction. This is shown to be true even if the brushes are highly compressed, which is consistent with the observation by Raviv, et. al., that the friction for polyelectrolyte brush coated surfaces can be exceedingly low, even if the brushes are highly compressed.

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