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Contact lines on silicone elastomers promote contamination AURELIE HOURLIER-FARGETTE, ARNAUD ANTKOWIAK, SEBASTIEN NEUKIRCH, UPMC (Paris), Institut Jean Le Rond d'Alembert — Silicone elastomers are used in contact with aqueous liquids in a large range of applications. Due to numerous advantages such as its flexibility, optical transparency, or gas permeability, polydimethylsiloxane is widely spread in rapid prototyping for microfluidics or elastocapillarity experiments. However, silicone elastomers are known to contain a small fraction of uncrosslinked low-molecular-weight oligomers, the effects of which are not completely understood. We show that in various setups involving an air-water-silicone elastomer contact line, a capillarity-induced extraction of uncrosslinked oligomers occurs, leading to a contamination of water-air interfaces. We investigate the case of a static air-water-PDMS contact line, before focusing on moving contact lines. A water droplet sliding down on a PDMS inclined plane or an air bubble rising on an immersed PDMS plane exhibits two successive speed regimes: the second regime is reached only when a monolayer of oligomers completely covers the water-air interface. These experiments involve processes occurring at the polymer network scale that have significant macroscopic consequences, and therefore provide a simple test to evaluate the presence of uncrosslinked oligomers in an elastomer sample.

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