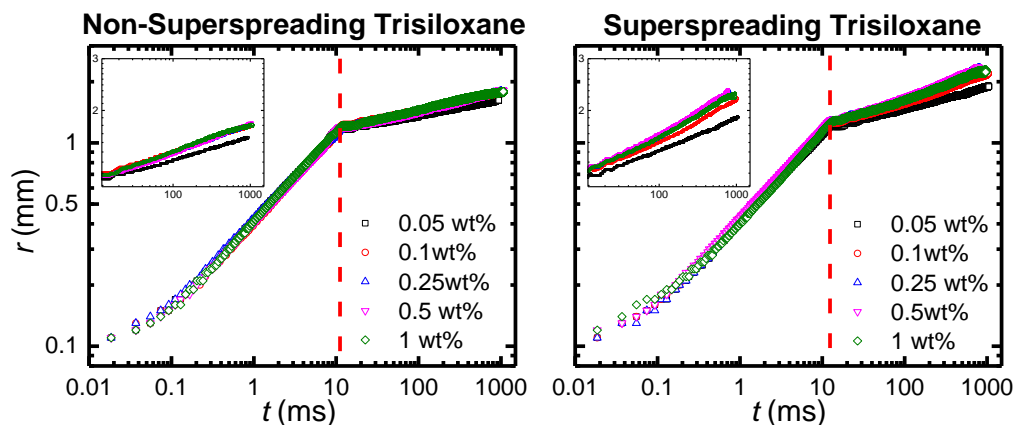


## P.48 Dynamic wetting of hydrophobic polymers by aqueous surfactant and superspreader solutions

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We carried out a systematic study on the wetting dynamics of aqueous solutions of conventional ionic surfactants (CTAB, SDS) and nonionic trisiloxanes (TSS10/2, TSS6/3) with different concentrations on hydrophobic polypropylene substrates. We showed that – depending on the surfactants – one, two, or three stages of dynamic wetting occurred, and that each stage was described by power law dynamics. For all surfactant solutions, the early wetting stage was dominated by inertia and the duration of this stage was not influenced by the presence of surfactants. For CTAB and SDS solutions, only this wetting stage was observed. For both trisiloxanes, after the inertial stage we observed a second viscosity-dominated wetting stage. In this stage, TSS10/2 showed an enhanced wetting capability independent of its concentration, while TSS6/3 started to show a concentration-dependent spreading behavior that was fully developed in a third “superspreading” stage. Our findings suggest that the superspreading property of TSS6/3 began to take effect after a characteristic time, before which the superspreading TSS6/3 and the non-superspreading TSS10/2 behaved similarly. Power law fits to the superspreading regime are in agreement with an interpretation of Marangoni flows resulting from surface tension gradients.



Log-Log plots of spreading radius  $r$  vs. time  $t$  of aqueous drops of non-superspreading and of superspreading trisiloxane solutions on polypropylene. Insets zoom in the spreading data in the second stage.

- [1] X. Wang, L. Chen, E. Bonaccorso, and J. Venzmer, Langmuir 29, 14855 (2013)
- [2] J. Venzmer, Curr. Opin. Colloid Interface Sci. 16, 335(2011)