SOME INTERESTING THINGS ABOUT THE
POLYSILOXANES

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Abstract
Poly(dimethylsiloxane) [–Si(CH3)2O–] is by far the most studied of the polysiloxanes, and it’s known to exhibit some
intriguing physical properties, in particular very high permeability to gases. Simulations are underway in an attempt to
understand some of these peculiarities. In addition, other symmetrically-substituted polysiloxanes exhibit mesophases
that are not understood at all. In the case of cross-linked polysiloxanes, there have been many important developments,
including (i) elastomers undergoing strain-induced crystallization through control of chain stiffness or stereochemical
structure, (ii) model elastomers (including dangling-chain networks), (iii) possible thermoplastic elastomers, (iv)
bimodal network chain-length distributions, (v) cross linking in solution or in a state of deformation, and (vi) gel
collapse. Interesting elastomeric composites include those with (i) in-situ generated ceramic-like particles, (ii)
ellipsoidal fillers, (iii) clay-like layered fillers, (iv) polyhedral oligomeric silsesquioxane (POSS) particles, (v) porous
fillers, (vi) controlled particle-elastomer interfaces, and (vii) elastomeric domains generated within ceramic phases.
Also of interest are some new techniques that have been used to characterize polysiloxane networks such as pulse
propagation measurements, and attempts to recycle polysiloxanes.

Bibliography
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