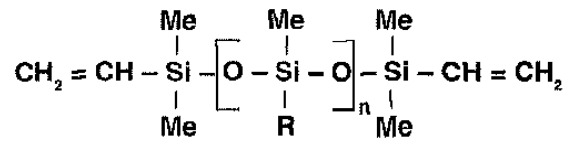
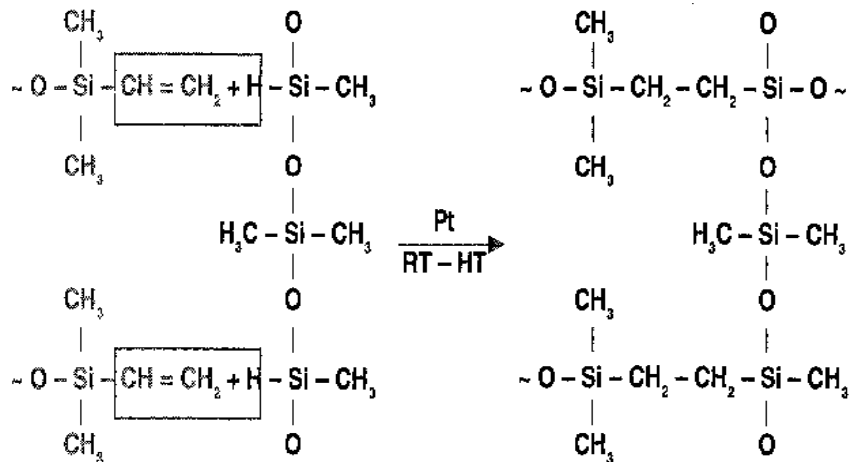


# PDMS Analysis

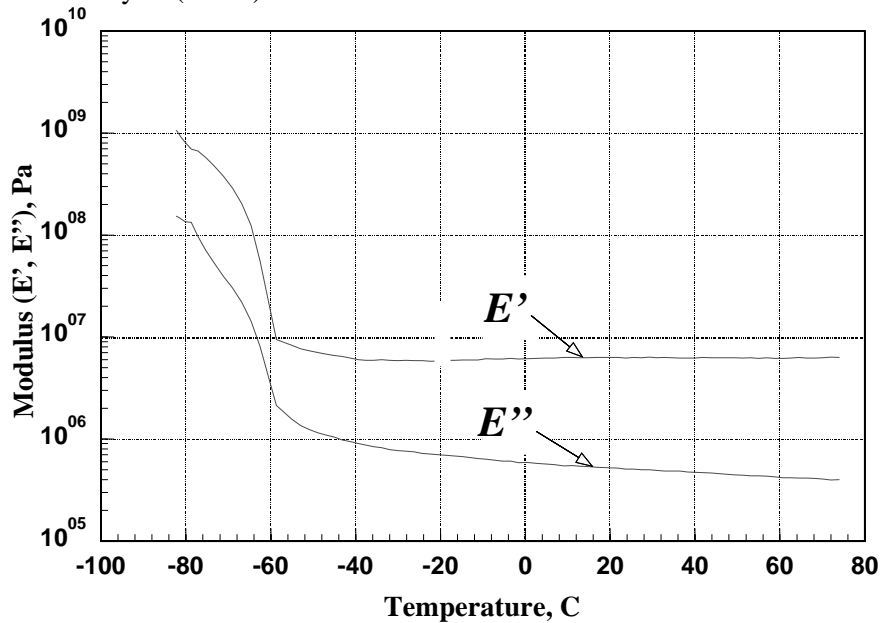
Vinyl-terminated polydimethyl siloxane (PDMS)



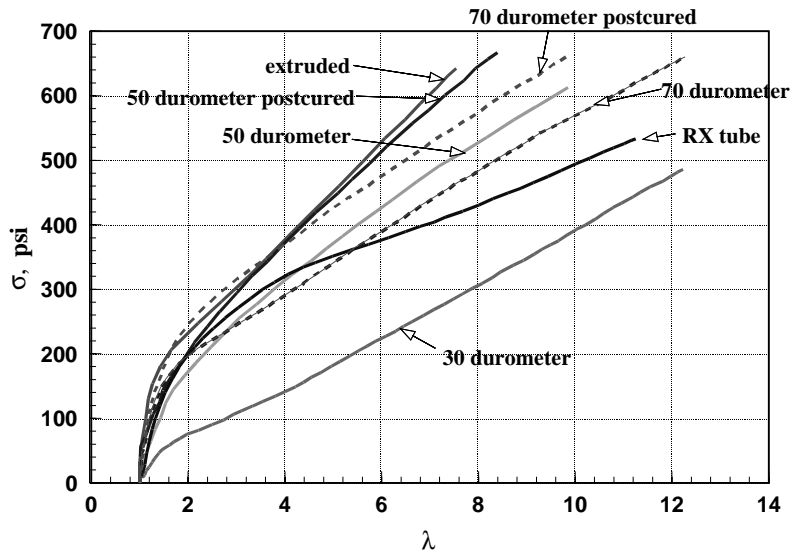
Curing via methylhydrogensiloxane with platinum catalyst:



Dynamic mechanical analysis (DMA):



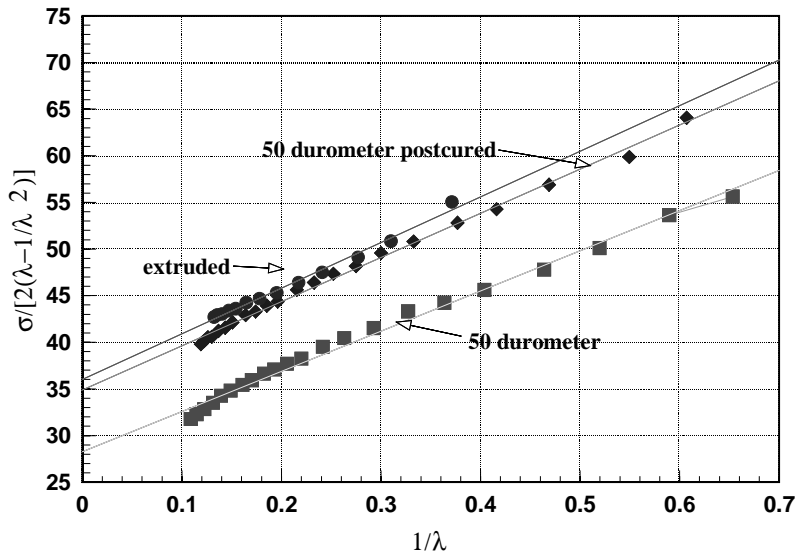
Tensile testing:

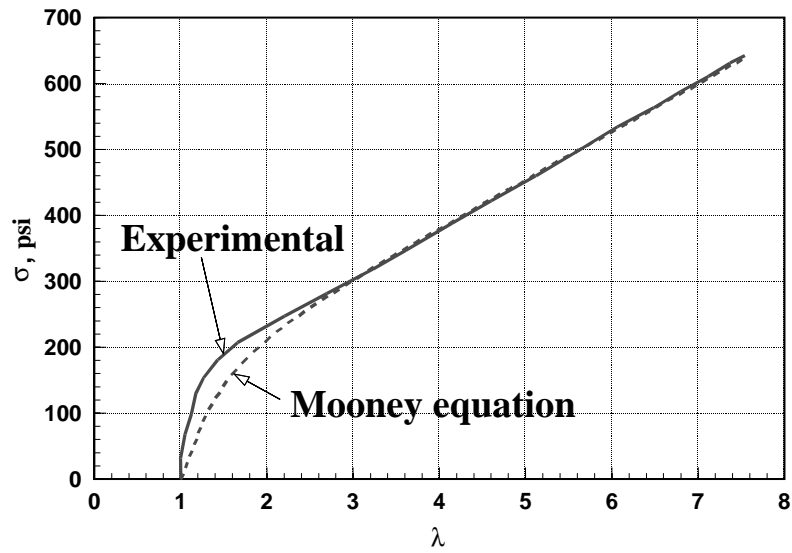


Mooney-

Mooney-Rivlin equation:

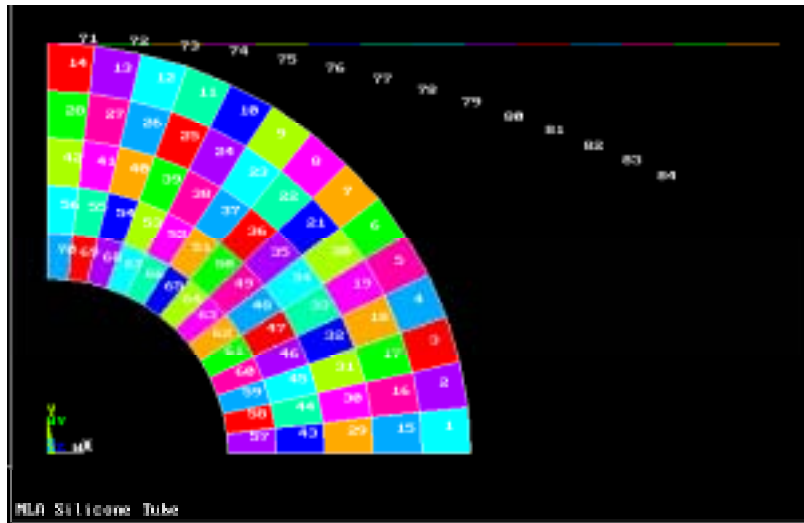
$$\sigma = 2 \left( \lambda - \frac{1}{\lambda^2} \right) \left( C_1 + \frac{C_2}{\lambda} \right) \rightarrow \frac{\sigma}{2 \left( \lambda - \frac{1}{\lambda^2} \right)} = C_1 + \frac{C_2}{\lambda} \quad (1)$$



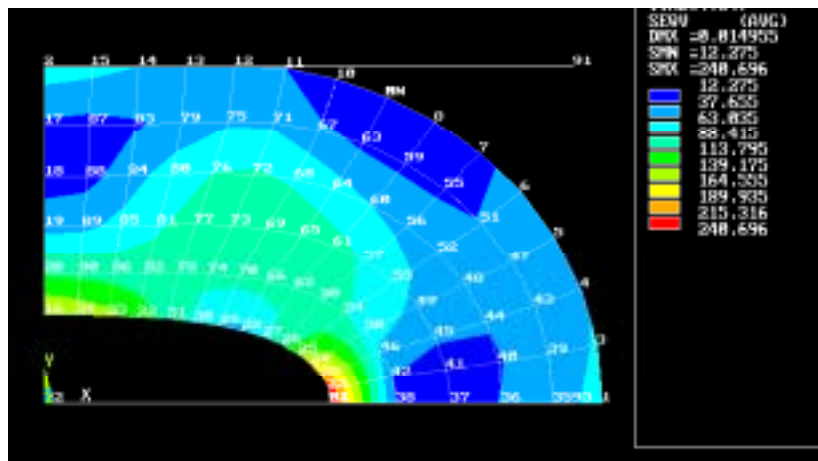


Finite element analysis of PDMS tube:

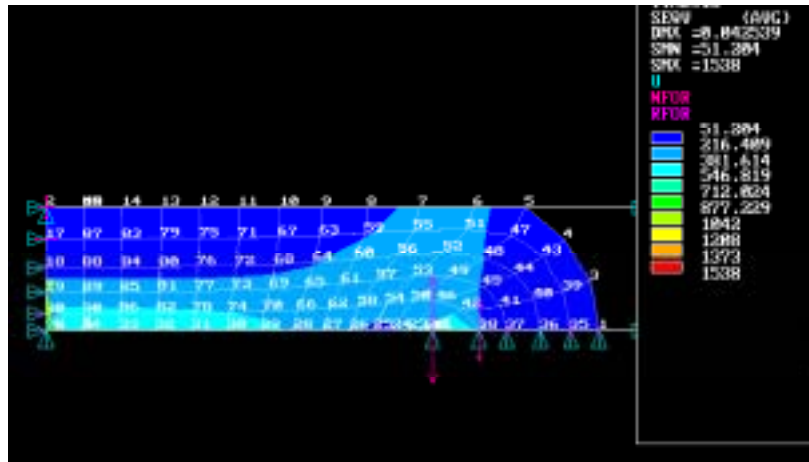
1. unloaded



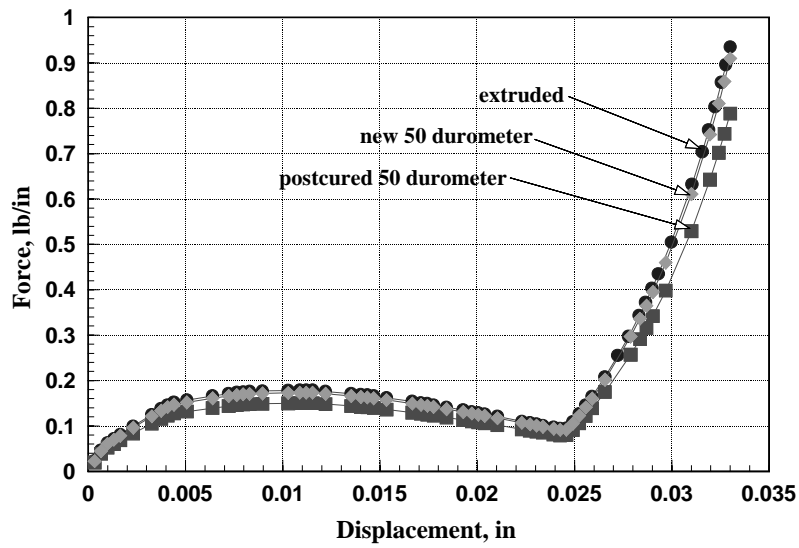
2. Partially compressed:



3. Fully compressed



4. Loading/unloading curves



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### 3.11 Mechanics of Materials

Fall 1999

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