PDMS Analysis

Vinyl-terminated polydimethyl siloxane (PDMS)

\[
\text{CH}_2 = \text{CH} - \text{Si} - \text{O} - \text{Si} - \text{O} - \text{Si} - \text{CH} = \text{CH}_2
\]

Curing via methylhydrogensiloxane with platinum catalyst:

Dynamic mechanical analysis (DMA):

Tensile testing:
Mooney-Rivlin equation:

\[
\sigma = 2 \left( \lambda - \frac{1}{\lambda^2} \right) \left( C_1 + \frac{C_2}{\lambda} \right) \Rightarrow \frac{\sigma}{2 \left( \lambda - \frac{1}{\lambda^2} \right)} = C_1 + \frac{C_2}{\lambda}
\] (1)
Finite element analysis of PDMS tube:

1. unloaded

2. Partially compressed:

3. Fully compressed
4. Loading/unloading curves
3.11 Mechanics of Materials
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