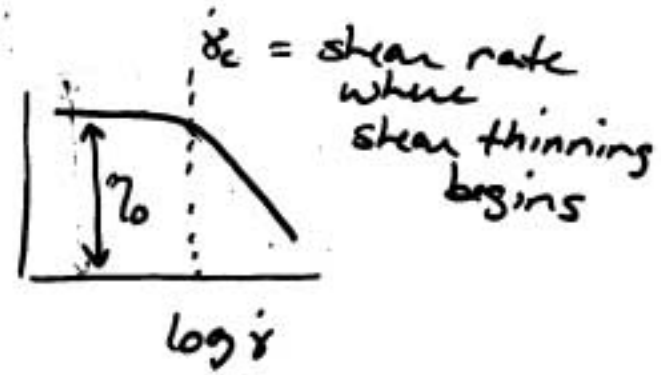
CHAPTER 6

(A) STEADY SHEAR

(1) Linear Polymers steady shear

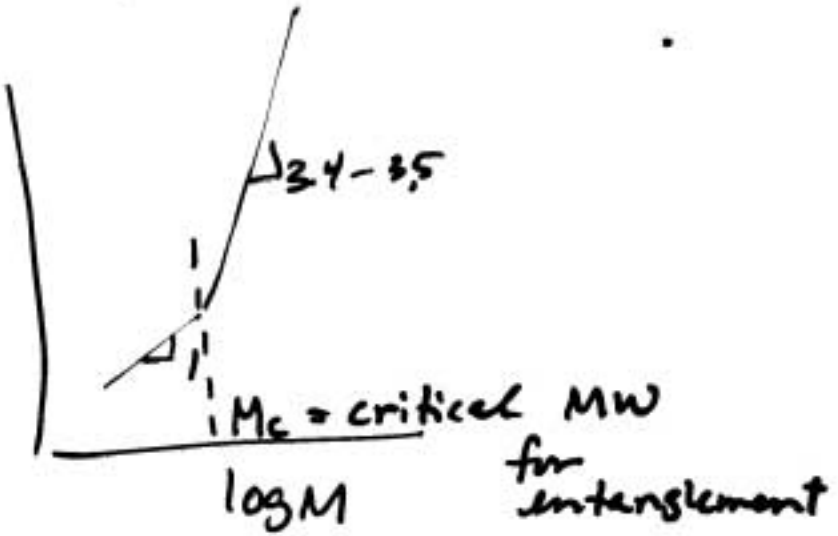


η_0 = zero shear viscosity

$\Psi_1 > 0$

$\Psi_2 < 0 \quad |\Psi_2| \sim 0.1\,|\Psi_1|$

(2) Variation w/ MW



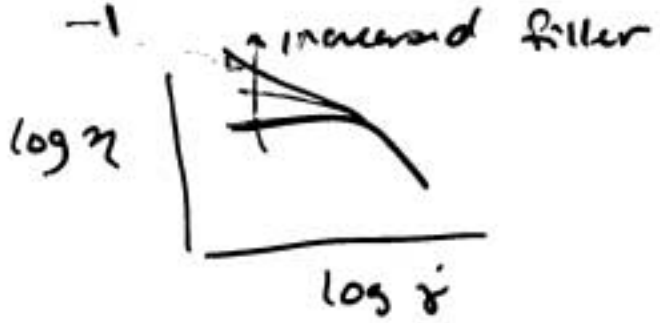
③ Effect of Molecular Wt Distribution

④ Architecture (branching)

- branches slow polymer relaxation
- effects are complicated.

⑤ Mixtures

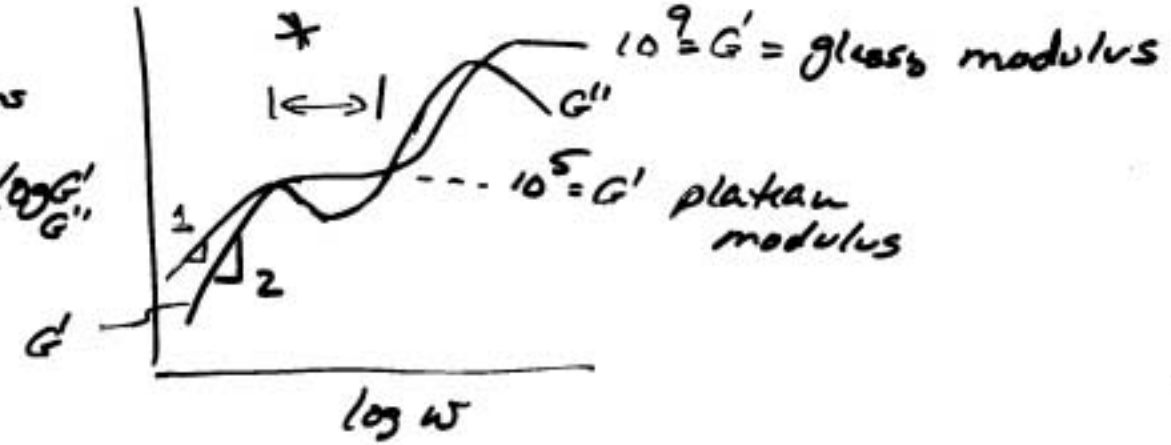
- filler effect (classic)



- suspensions (complex)
  shear thickening

(B) SAOS - small amplitude oscillatory shear

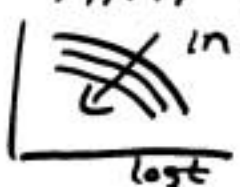
(1) linear polymers



* the broader the plateau, the higher the MW

(2) all other materials — we can use literature data (e.g. Ferry's book) as a reference to understand SAOS data on an arbitrary material

(C) LARGE AMPLITUDE SHEAR STEP STRAIN



($h(\gamma_0)$ = shift function
= damping function)

(D) STEADY ELONGATIONAL VISCOSITY

Very hard to take this data!

(E) SAOE - small amplitude oscillatory elongation

$$3\,(SAOS) = SAOE$$

$$3G' = E'$$

$$3G'' = E''$$

(F) Large amplitude Elongation Step Strains