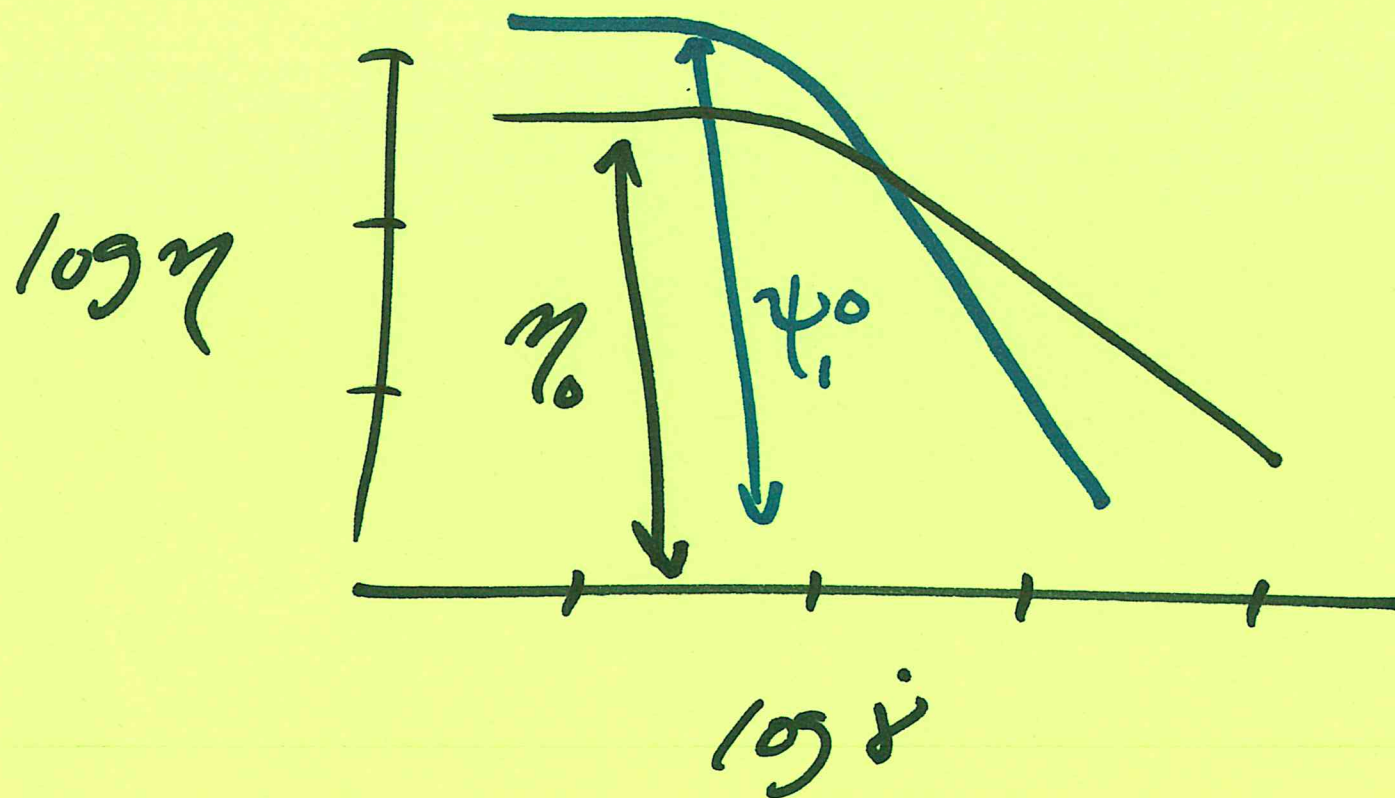


①

Material
Behavior for
Exam 2
2020

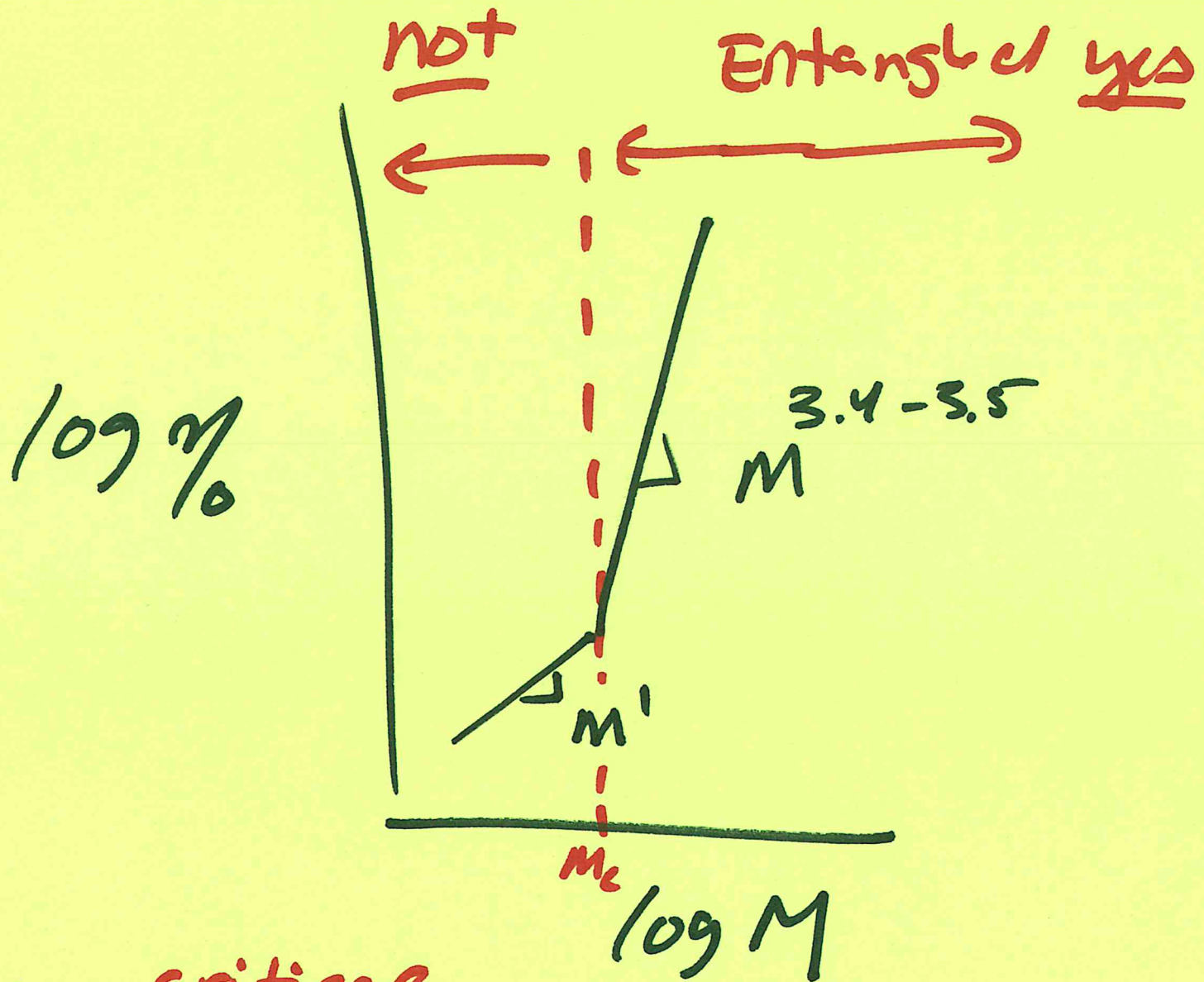
(2)

Steady shear viscosity
 η conc. polymer solution
 (linear polymer)



$\psi_2 \approx 0$ but not always

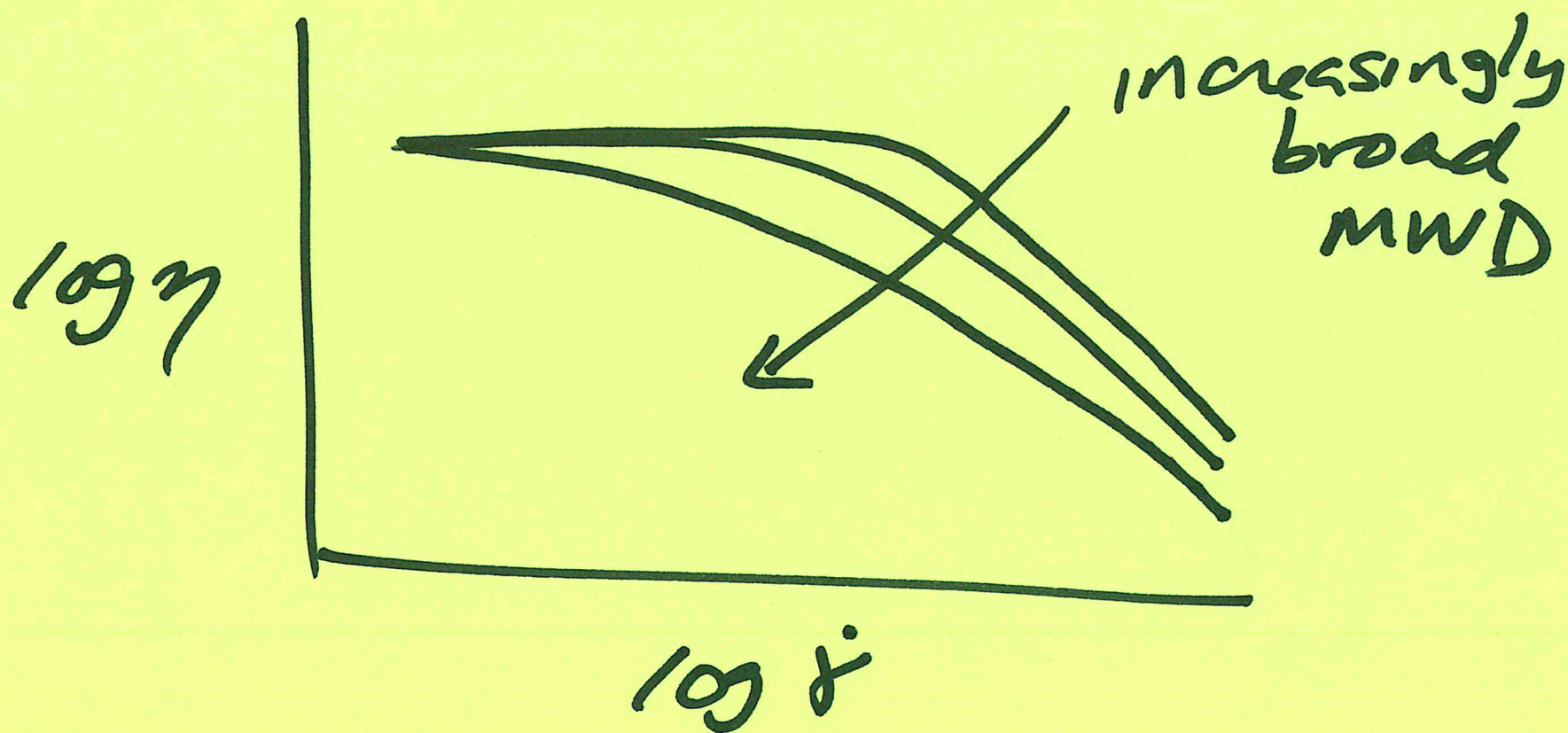
3



M_c - critical
molecular weight
for entanglement

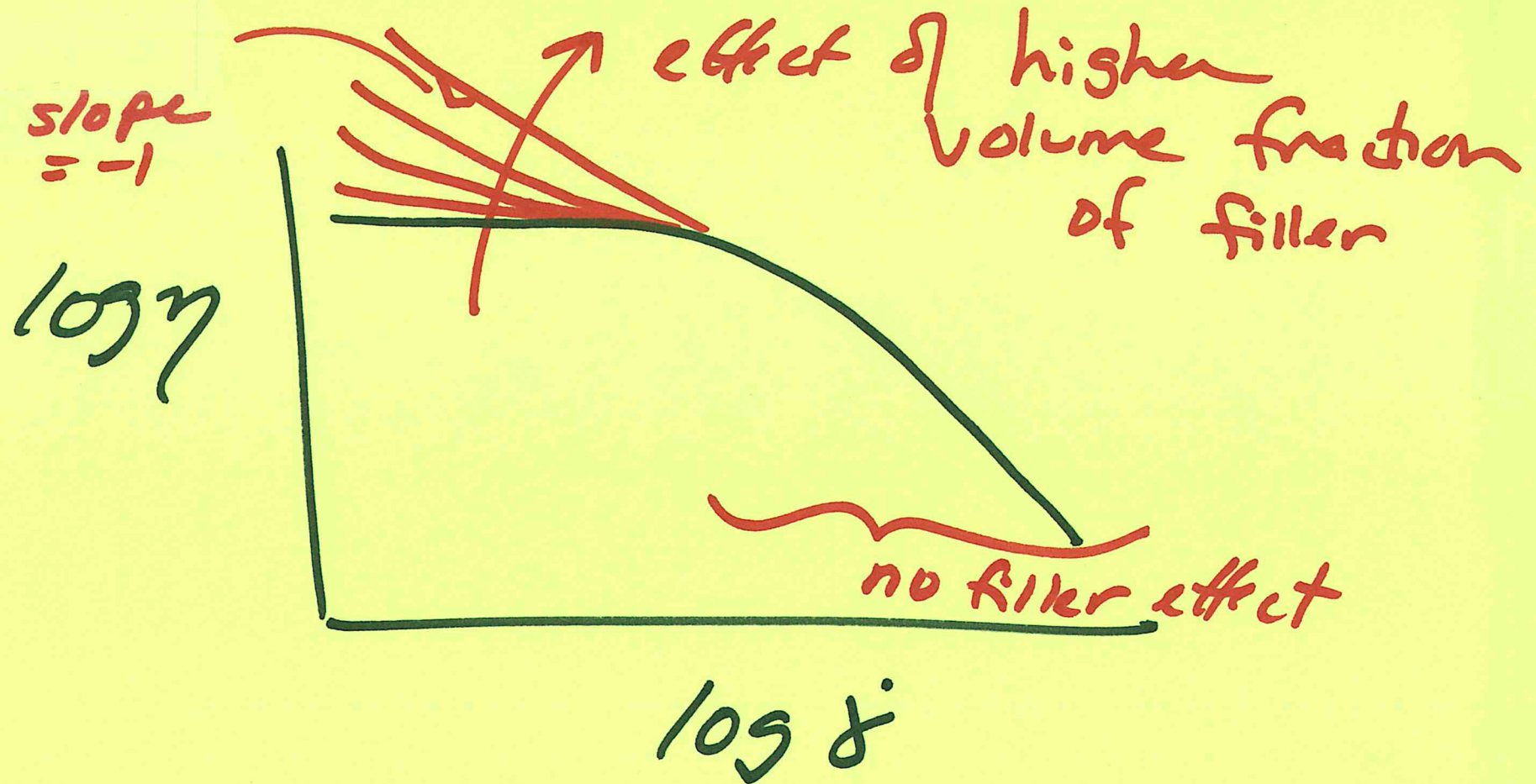
Effect of Molecular Weight Distribution (MWD)

④



Effect of adding filler

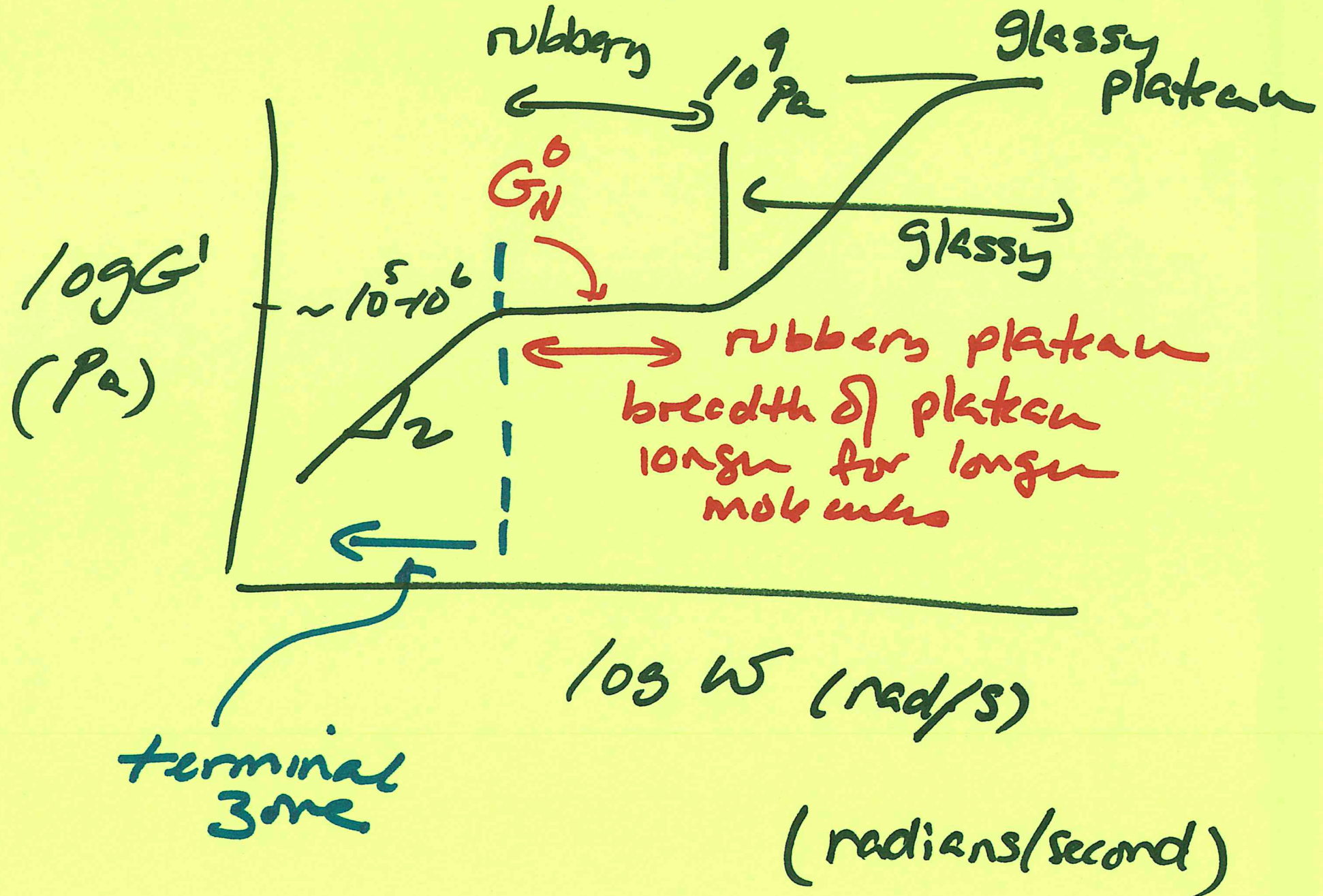
⑤



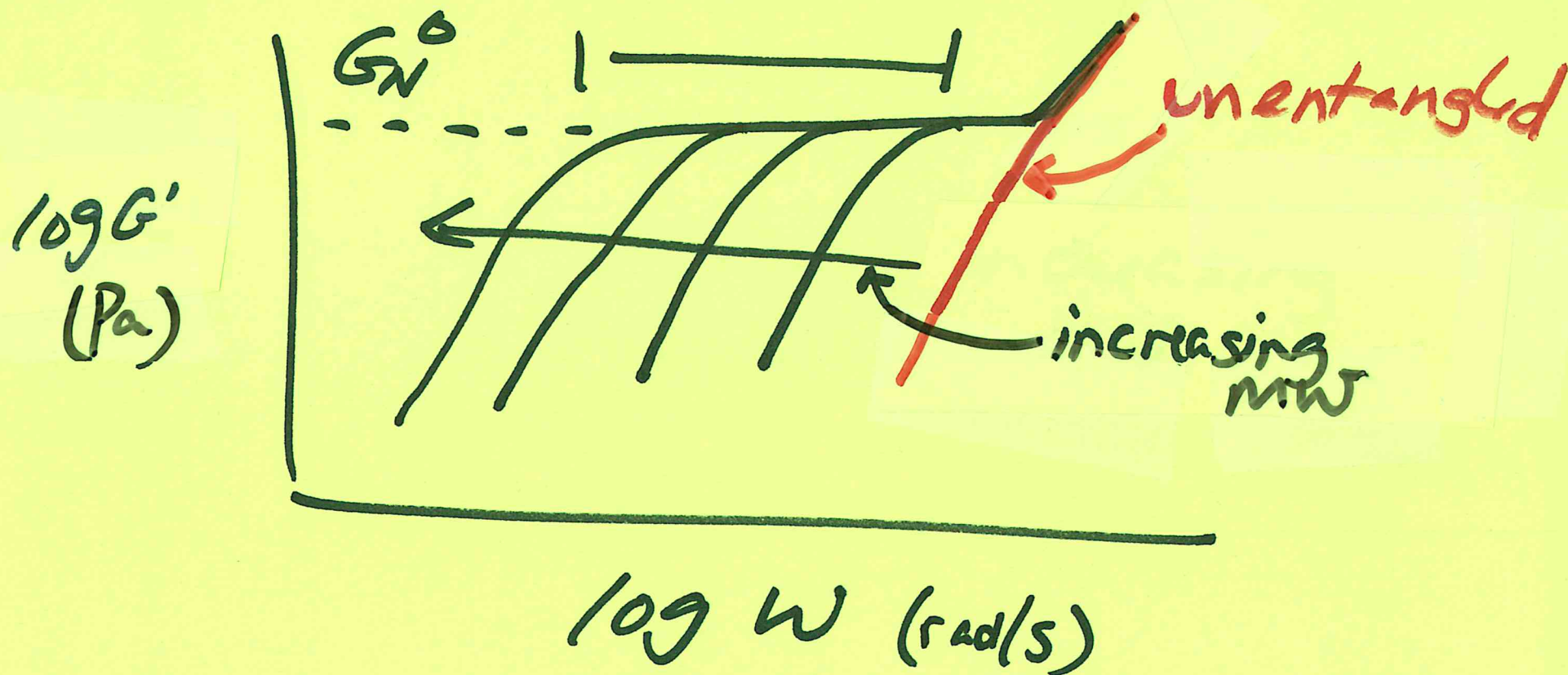
SAOS

Linear Polymers

⑥



⑦



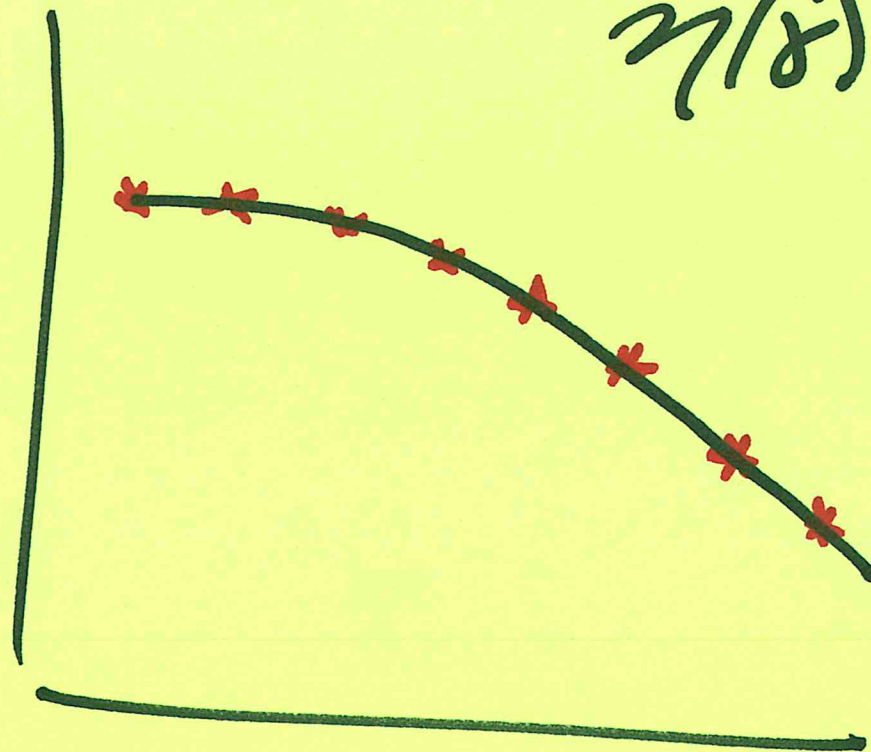
G_N^0 = plateau modulus
 = only present in entangled polymers

Cox Merz rule -

A "lucky" rule that
relates SAOS + steady shear

$$\eta(\dot{\gamma}) = \frac{\eta^*(w)}{\dot{\gamma} = w}$$

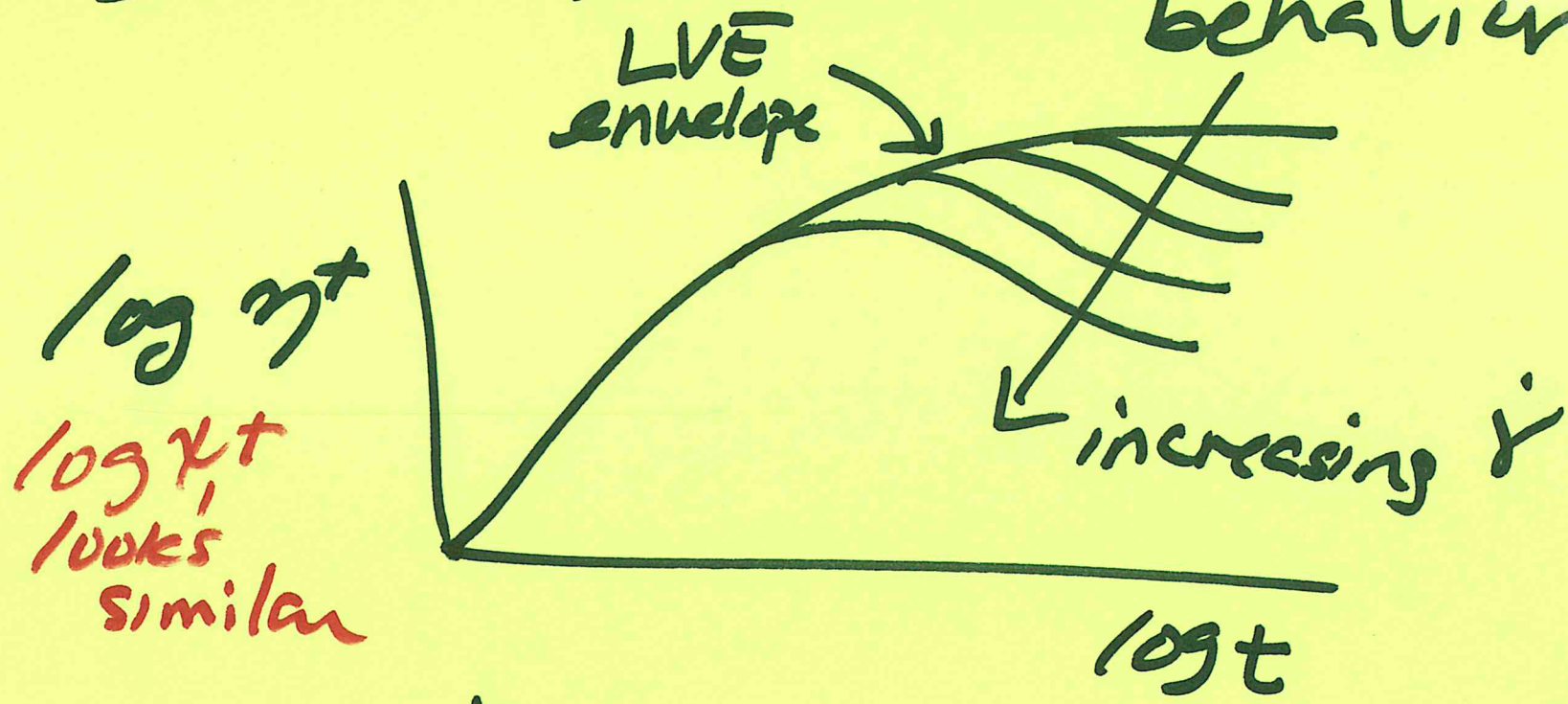
$\log \eta$
 $\log \eta^*$



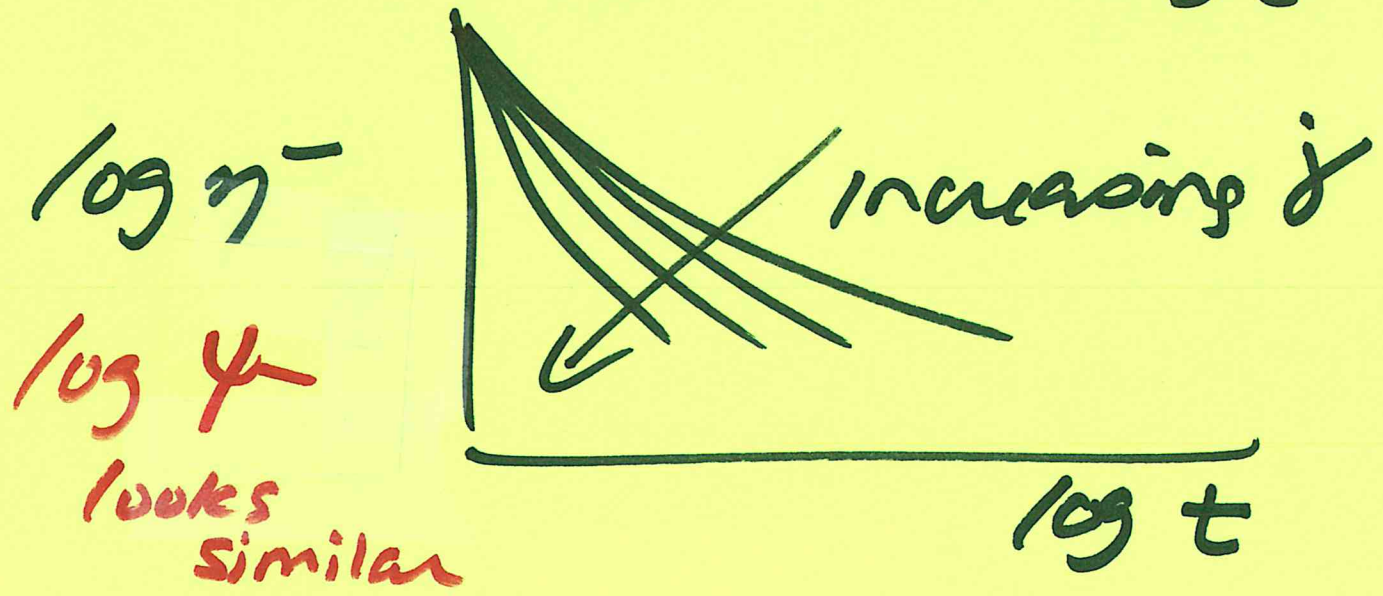
(a good
"cheat" for
 $\eta(\dot{\gamma})$ but
not always true!)

⑨

Start-up + Cessation behavior



$\log \eta^+$
looks similar



$\log \eta^-$
looks similar

Steady

Elongational flow

⑩

$$\bar{\eta} = \eta_e$$



v. hard to take
at $\dot{\epsilon}_0$

$\log \eta_e$
(Pa.s)



$$\lim_{\dot{\epsilon} \rightarrow 0} \frac{\eta_e}{\eta_0} = 3$$

$\log \dot{\epsilon}$ (s^{-1})

==