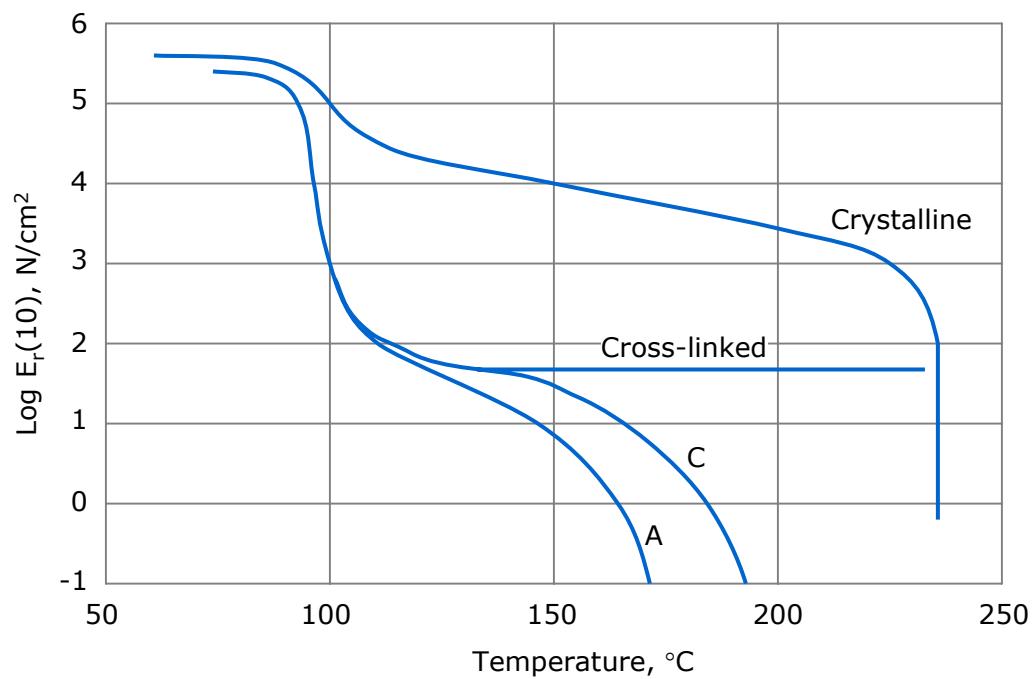


Lecture 4

Polymer Crystallinity

Example: Spherulites

See Figures 2.4 and 2.8 in McCrum, N.G. "Principles of polymer engineering"
New York: Oxford University Press, 1997



after Arthur Tobolsky, *Properties and structure of polymers* (Wiley, 1960)

Glass Transitions

		$T_g, ^\circ C$
poly α -methyl styrene	$-CH_2 - \begin{array}{c} CH_3 \\ \\ C \\ \\ \text{C}_6\text{H}_4 \end{array}$	175
polycarbonate (PC)	$-O - \text{C}_6\text{H}_4 - \begin{array}{c} CH_3 \\ \\ C \\ \\ CH_3 \end{array} - \text{C}_6\text{H}_4 - O - C = O$	150
polyacrylonitrile (PAN)	$-CH_2 - \begin{array}{c} H \\ \\ C \\ \\ C \equiv N \end{array}$	104
polystyrene (PS)	$-CH_2 - \begin{array}{c} H \\ \\ C \\ \\ \text{C}_6\text{H}_4 \end{array} -$	100
Polyvinyl chloride (PVC)	$-CH_2 - \begin{array}{c} H \\ \\ C \\ \\ Cl \end{array} -$	83
Polyethylene	$-O - \begin{array}{c} O \\ \\ \text{C}_6\text{H}_4 \\ \\ O \end{array} - O - CH_2 - CH_2 -$	69
terephthalate (PET)		
nylon 66	$-C = O - (CH_2)_4 - C = O - N - (CH_2)_6 - N -$	50
Polypropylene (PP)	$-CH_2 - \begin{array}{c} H \\ \\ C \\ \\ CH_3 \end{array} -$	-19
Polyisoprene (NR)	$-CH_2 - C = C - C = CH_2 -$	-73
Polyethylene (PE)	$-CH_2 - CH_2 -$	-80
Poly-dimethyl siloxane	$-Si(CH_3)_2 - O -$	-123

See graphs of glass transition temperature in
Bicerano, Josef. *Prediction of Polymer Properties*.
New York: Marcel Dekker, 2002