080519 Quiz 6 Introduction to Polymers

- Polyurethane in the video shown in class is formed from two liquids that are mixed. After mixing the solution foams and expands fairly rapidly forming a solid foam after a few minutes.
 - a) One of the liquids contains MDI. Give the full name and structure for MDI.
 - b) What is the reactant (co-monomer) in the second liquid?
 - c) Name a catalyst (give acronym) that might be in the second liquid.
 - d) What role would water play if it were present in the second liquid?
 - e) What happens if a diamine is used rather than what you listed in part b?
- 2) On Friday we made a novolac polymer
 - a) What two reactants were used to make the novalac?
 - b) How do these reactants differ from those used to make a resole polymer?
 - c) For the novolac what condition is needed?
 - d) Outline the reaction scheme for formation of the novolac polymer.
 - e) Why was the novolac pink?

3) We also discussed polyimides and epoxys last week.

- a) Give the structure of an imide bond.
- b) Give the reactants that form a cyclic polyimide such as kapton.
- c) Show the two reaction steps to form a polyimide
- d) Give the structure of epichlorohydrin.
- e) Give the structure of a glycidyl ether.

1) a) methylene 9, 4' diphenyl di iso ryana he 0=c=N-(0)-(1-(0)-N=C=0 6) A dial ethylow slord 40 - c/2 (1/2 - 0/4 or poly ethylene only 40 { (1/2 - C/2 - 0] H 0) DAPCO d) Wale + isoryanate = CO2(5) # N-n (e, (j) = Found G e) You From a Koly area -A (N-C'-N-R)

2) a) Newol & Kuma do hyde 60-60 6) Same reaction la tra teso lo c) Acid we used Arehic orid + HCI d) 9th + Mataster B* + M Substantion H H Acid L Cendensahun L = + H20 Pava Subjection Plt 04 04 outo + pava sussitive kel (0)

 (\mathcal{O}) Structure is Similar to thes builture of Phonoloph that kin e) (0)-04 ptted К'- C-N-C-л' orange 3) a) pyromellitiz augule diam. lp 4N-R-W1/2 c)Rfn i Pricou Murens (N'

Ø d) cH-CH-CL epichloso hydrin e) CH-CH-O-R glycidyletter