Polymers
Learning Objectives, Fall '06, Biomaterials (BE-410)

Be able to list three typical advantages of polymers relative to metals and ceramics.

Be able to list two typical disadvantages of polymers relative to metals and ceramics.

Be able to name two types of polymerization reactions and a polymer of biomedical interest produced by each method.

Be able describe three processing techniques typically used to fabricate polymeric components.

Be able to explain how chemical and/or physical cross-linking influences the behavior of polymeric materials.

Be able to describe how mechanical properties of a polymer typically change as it passes through its glass transition temperature.

Be able to describe the typical features and biomedical uses of polyamides.

Be able to name a common polyolefin.

Be able to describe the typical features and biomedical uses of polyolefins.

Be able to describe two simple substituted ethylene polymers (like PVC and polystyrene).

Be able to name a common polyacrylate.

Be able to describe the typical features and biomedical uses of polyacrylates (like PMA and PMMA).

Be able to describe the general chemistry of polyurethane thermal plastic elastomers.

Be able to describe the possible cross links in polyurethane thermal plastic elastomers.

Be able to describe the chemistry and processing of polyethylene terephthalate (PET).

Be able to describe the typical features and biomedical uses of fluorocarbon polymers.

Be able to describe the typical features and biomedical uses of silicone elastomers.

Be able to describe the typical features and biomedical uses of hydrogels.

Be able to describe the typical features and uses of super absorbent polymers (SAP).

Be able to describe a few interesting uses (preferably biomedical) and features of each of the following polymers: PVC, polystyrene, PMMA, poly(N-butyl cyanoacrylate), carbon

chain elastomers, PTFE, PET, setting type polyesters, elastomeric polyurethane, polyamides and poly(dimethyl siloxane).