

UNIT 6 – ACTIVITY 2 – FILL-IN-THE-BLANKS

Fill in the missing words

A polymer that can be melted (i.e., a linear or branched polymer) is called a polymer.

Suppose that a bulk sample of a linear or branched polymer exists as a solid material at room temperature, and is subsequently heated. Due to the increase in energy, the average distance between individual molecular chains is as temperature is increased. This results in an increase in molecular and a decrease in secondary forces and macroscopic stiffness. That is, as the molecules move apart both the intermolecular forces of as well as the degree of is decreased, resulting in a decrease in stiffness at the macroscopic level. Eventually a temperature is reached at which the polymeric molecules can freely past each other, and the bulk polymer "melts"- that is, the polymer can no longer support a shear force. Typically, does not occur at a single temperature, but rather over a temperature range.

A polymer that cannot be melted (i.e., a cross-linked polymer) is called a polymer.

In contrast, a cross-linked polymer cannot be melted. Although the average distance between

individual segments of the molecular network are in fact as temperature is increased, the crosslinks do not allow unrestricted relative between chain segments, and eventually limit molecular motion. Therefore, a cross linked polymer cannot be and can support forces even at high temperatures. Of course, if the temperature is raised high enough the covalent that form the crosslinks as well as the "backbone" of the molecular chains are broken, chemical occurs, and the polymer is destroyed.