Carraher s Polymer Chemistry 10th edition Carraher Jr Test Bank

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The following is a collection of questions used by myself and others associated with material covered in *Polymer Chemistry*. They are somewhat intentionally broad because the course is often taught as an introduction covering many diverse topics. The questions are a combination of matching, short essay, short answers, etc. The points assigned to each problem is given as "( )" after the number of each problem and are based roughly on a 100 point exam. This is at best a general guide and should be modified as you feel best. Good luck.

Charles Carraher, Jr.

1. Definitions

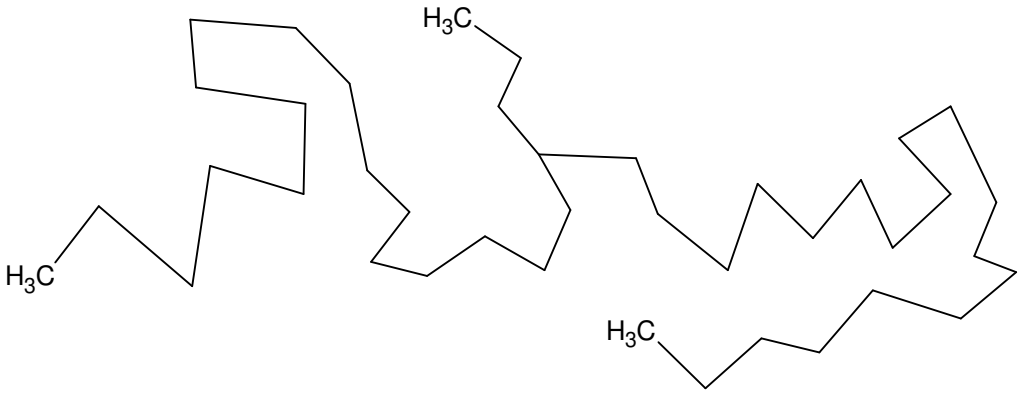
Match the following:
Amorphous ____
Atactic ____
Backbone ____
Copolymer ____
Crystalline ____
Crosslinks ____
Degree of polymerization ____
DSC (differential scanning calorimetry) ____
Entropy of mixing ____
Glass transition temperature ____
Helix and pleated ____
Hilderband's equation ____
Homopolymer ____
Mark–Houwink equation ____
Melting point or range _____
Mer ____
Plasticizer ____
Polymer or macromolecule ____
Protein ____
TGA or TG (thermal gravimetric analysis) ____
Vinyl polymer ____
Young's modulus ____

A. A compound that "solubilizes" only a portion of a polymer chain; added to give flexibility.
B. Repeat unit in a polymer chain.
C. Polymer derived from the polymerization of vinyl monomers.
D. Temperature range or poliont where a polymer achieves full chain mobility.
E. Temperature range where only local, segmental mobility occurs; where only relatively small portions of the polymer can move.
F. Polymer where there is a random arrangement of pendant groups on each side of the polymer backbone.
G. Polymer portion with a highly ordered structure.

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H. Polymer portion with a (highly) disorganized structure.
I. Molecule composed of many mers or repeat units; a very large molecule.
J. Number of units within a polymer.
K. Covalent or physical bonds between two or more linear polymer chains.
L. Polymer composed of only one repeat unit.
M. Polymer composed of more than one repeat unit; usually employed to describe a vinyl polymer derived from two different vinyl molecules
N. Principal chain in a polymer molecule.
O. Describes the forces holding a material together; CED; used to help predict solubility.
P. Major force that encourages (drives) solubility.
Q. Viscosity $=KM^a$.
R. Stress–strain.
S. Measures energy (heat) changes typically as a function of temperature.
T. Measures weight changes typically as a function of temperature.
U. Most common shapes of polymers.
V. Natural "nylon"; composed of amino acid units.

2. For the following polymer chain, circle only a branch point; draw a dotted line abount the two end-groups; and indicate by a two-headed line (<---->) the end-to-end distance.



3. Underline only those that would be more likely to soften and melt if heated.

Uncrosslinked polyethylene or highly crosslinked rubber

4. Underline only those polymers where hydrogen bonding occurs within and/or between polymer chains.

Nylon/protein Polyethylene Cellulose

Polybutylene Polyester

5. A. What is the molecular weight of polyethylene, -(-CH_2CH_2-)-, which has a DP of 100?
_____

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B. What is the DP of a polyethylene that has a molecular weight of 56,000 Da? _____

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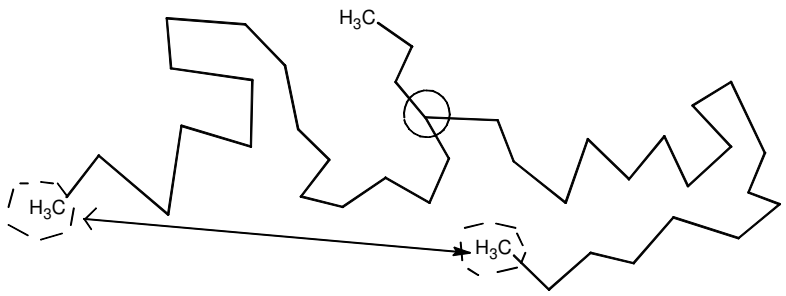
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Nylon/protein Polyethylene Cellulose

Polybutylene Polyester

5. A. What is the molecular weight of polyethylene, -(-CH_2CH_2-)-, which has a DP of 100?

100 units × 28 amu/unit = 2800

B. What is the DP of a polyethylene that has a molecular weight of 56,000 Da?

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56,000 amu/28 amu/unit = 2000 units

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