Sample Questions
Polymer Technology

1. Which of the following polymers is/are used in artificial eye parts, signal light lenses and television screens?
   a. Buna-S
   b. Poly (methyl methacrylate)
   c. Polytetrafluoroethylene
   d. Polyurethane
   e. All of the above

2. Which of the following types of polymers can poly acrylonitrile be classified as?
   a. Condensation polymer
   b. Addition polymer
   c. Natural polymer
   d. None of the above

3. What does the area under the stress vs. strain curve quantify?
   a. The compliance of the material with the specifications
   b. The energy to elastically change the shape of the material
   c. The impact strength of the material
   d. Toughness of the material
4. A sample of atactic polystyrene, separated into 4 fractions is shown in the table. What is the average molecular weight?

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Number of moles</th>
<th>Molecular Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>50,000</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>50,000</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>30,000</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>70,000</td>
</tr>
</tbody>
</table>

a. 40,000  
b. 50,000  
c. 60,000  
d. 70,000

5. Which of the following is/are NOT a suitable oxidizing agent for oxidative doping of polyacetylene?
   
a. Iodine vapor  
b. Acidified potassium dichromate  
c. Iodine in carbon tetrachloride  
d. Sodium naphthalide in THF

   a. Only i  
b. Only iii  
c. i and iii  
d. i, ii and iv  
e. i, ii, iii, iv

6. Consider the shown figure

(\text{B-B-B- \cdots B-B}) \quad (\text{A-A-A- \cdots A-A}) \quad (\text{B-B- \cdots B-B-B})

\sim 5\% \quad \sim 90\% \quad \sim 5\%

If A = butadiene and B = styrene, how would this polymer be synthesized?

a. By anionic polymerization  
b. By using a Ziegler Natta catalyst  
c. By condensation polymerization  
d. By coordination polymerization
7. A partially miscible blend of two polymers will have __________.
   a. a single Tg
   b. two Tg values closer to Tg values of original polymers
   c. a single Tg value that lies in between Tg values of original polymers
   d. no Tg

8. Which of the following polymers will have the highest Tg value?

   A. \[ \begin{array}{c}
   \text{CH}_2-\text{CH} \\
   \text{Cl}
   \end{array} \]
   B. \[ \begin{array}{c}
   \text{CH}_2-\text{CH} \\
   \text{CH}_3
   \end{array} \]
   C. \[ \begin{array}{c}
   \text{CH}_2-\text{CH}_2 \\
   \text{O}
   \end{array} \]
   D. \[ \begin{array}{c}
   \text{CH}_2-\text{CH}_2
   \end{array} \]

   a. A
   b. B
   c. C
   d. D

9. Which of the following techniques is commonly used to make lotion bottles?

   a. Stretch blow molding
   b. Injection blow molding
   c. Extrusion blow molding
   d. Spin trimming molding

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