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Courses » Introduction to Materials Science and Engineering

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## Unit 7 - Week 4 - Structure of Solids III

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Certification exam

### Course outline

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the portal

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Week 1 -  
Crystallography  
I

Week 2 -  
Crystallography  
II + Structure of  
Solids I

Week 3 -  
Structure of  
Solids II

Week 4 -  
Structure of  
Solids III

- Week 4  
Overview
- Week 4  
Reading List
- 4.1 Carbon  
Nanotubes  
(CNT)
- 4.2  
Buckminsterfullerene  
(C<sub>60</sub>)

## Assignment 4

The due date for submitting this assignment has passed.

As per our records you have not submitted this **Due on 2019-02-27, 23:59 IST.**  
assignment.

1) If the radius ratio of cations to anions,  $R_C/R_A = 0.45$ , what will be the local coordination of anions around the cation? **1 point**

- Triangular
- Tetrahedral
- Octahedral
- Cubic

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Octahedral*

2) The carbon atoms in C<sub>60</sub> molecule are located at the vertices of a/an \_\_\_\_\_. **1 point**

- icosahedron
- dodecahedron
- truncated icosahedron
- tetrakaidecahedron

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*truncated icosahedron*

3) What is the coordination number of ZnS predicted based on the radius ratio?  $R_{Zn^{2+}} = 0.83$  Å,  $R_{S^{2-}} = 1.74$  Å **1 point**

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<ul style="list-style-type: none"> <li><input type="radio"/> CsCl</li> <li><input type="radio"/> 4.8 Amorphous Solids</li> <li><input checked="" type="radio"/> 4.9 Polymers</li> <li><input type="radio"/> 4.10 Vinyl Polymers</li> <li><input checked="" type="radio"/> 4.11 Thermoplasts and Thermosets</li> <li><input checked="" type="radio"/> 4.12 Tacticity</li> <li><input type="radio"/> 4.13 Copolymers</li> <li><input checked="" type="radio"/> 4.14 Crystallinity in Polymers</li> <li><input type="radio"/> Quiz : Assignment 4</li> <li><input type="radio"/> Assignment 4 Solutions</li> </ul>	ce De	<p><b>Accepted Answers:</b> 6</p> <p>4) In isotactic polystyrene, the <math>C_6H_5</math> side group <span style="float: right;"><b>1 point</b></span></p> <ul style="list-style-type: none"> <li><input type="radio"/> appear on the same side of the main chain</li> <li><input type="radio"/> appear alternately on either side of the main chain</li> <li><input type="radio"/> appear randomly on either side of the main chain</li> <li><input type="radio"/> none of the above</li> </ul> <p><b>No, the answer is incorrect.</b> <b>Score: 0</b></p> <p><b>Accepted Answers:</b> <i>appear on the same side of the main chain</i></p> <p>5) Which of the following is a zig-zag carbon nanotube? <span style="float: right;"><b>1 point</b></span></p> <ul style="list-style-type: none"> <li><input type="radio"/> (5,5)</li> <li><input type="radio"/> (5,1)</li> <li><input type="radio"/> (5,0)</li> <li><input type="radio"/> (10,5)</li> </ul> <p><b>No, the answer is incorrect.</b> <b>Score: 0</b></p> <p><b>Accepted Answers:</b> <i>(5,0)</i></p> <p>6) The monomer of polyacrylonitrile has _____ and _____ as subgroups. <span style="float: right;"><b>1 point</b></span></p> <ul style="list-style-type: none"> <li><input type="radio"/> one CN group and three H atoms</li> <li><input type="radio"/> one <math>C_6H_5</math> and three H atoms</li> <li><input type="radio"/> two CN groups and two H atoms</li> <li><input type="radio"/> one Cl group and three H atoms</li> </ul> <p><b>No, the answer is incorrect.</b> <b>Score: 0</b></p> <p><b>Accepted Answers:</b> <i>one CN group and three H atoms</i></p> <p>7) The effective number of lattice points per unit cell in the lattice of CsCl is _____ and that in the lattice of NaCl is _____. <span style="float: right;"><b>1 point</b></span></p> <ul style="list-style-type: none"> <li><input type="radio"/> two, four</li> <li><input type="radio"/> one, two</li> <li><input type="radio"/> two, one</li> <li><input type="radio"/> one, four</li> </ul> <p><b>No, the answer is incorrect.</b> <b>Score: 0</b></p> <p><b>Accepted Answers:</b> <i>one, four</i></p> <p>8) The nature of bonding between the chains in a thermoplast is <span style="float: right;"><b>1 point</b></span></p> <ul style="list-style-type: none"> <li><input type="radio"/> van der Waal's forces</li> <li><input type="radio"/> covalent bonds</li> <li><input type="radio"/> metallic bond</li> </ul>
<b>Week 5 - Defects in Crystalline Solids I</b>		
<b>Week 6 - Defects in Crystalline Solids II</b>		
<b>Week 7 - Phase Diagrams I</b>		
<b>Week 8 - Phase Diagrams II + Diffusion</b>		
<b>Week 9 - Phase Transformations I</b>		
<b>Week 10 - Phase Transformations II + Mechanical Behaviour of Materials I</b>		
<b>Week 11 - Mechanical Behaviour of Materials II</b>		
<b>Week 12 - Mechanical Behaviour of Materials III + Fracture</b>		
<b>Interactive Session</b>		

ionic bond

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*van der Waal's forces*

9) "Soda addition to silicate glasses increases its melting point." True/False?

**1 point**

True

False

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*False*

10) Which of the following types of polymers is least likely to crystallize?

**1 point**

Syndiotactic polymers

Isotactic polymers

Block copolymers

Alternating copolymers

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Block copolymers*

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