

Unit 7 - Non-Crystalline Solids

Course outline

How to access the portal?

Introduction to Materials

Introduction to Crystallography

Structures of Materials

Solid Solutions & Structures

Classification of Ionic Solids

Non-Crystalline Solids

Lecture 26 : HCP based Structure

Lecture 27: Structure of Non-crystalline Solids (glasses)

Lecture 28 : Structure of Non-Crystalline Solids:Glasses(contd.)

Lecture 29 : Structure of Non-Crystalline Solids (Polymers)

Lecture 30 : Structure of Polymers

Quiz : Assignment-6

Assignment-6: Solution

Structure Determination

Imperfections in Solids

Week-0

Assignment-6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-10-09, 23:59 IST.

1) In wurtzite structured compounds 1 point

- cations occupy the tetrahedral voids.
- anion form a HCP lattice.
- coordination number of both cation and anion are 6.
- stoichiometry is of MX type.

No, the answer is incorrect.

Score: 0

Accepted Answers:

cations occupy the tetrahedral voids.

anion form a HCP lattice.

stoichiometry is of MX type.

2) Which of the following materials has non-zero dipole moment? 1 point

- TiO₂
- Al₂O₃
- FeTiO₃
- LiNbO₃

No, the answer is incorrect.

Score: 0

Accepted Answers:

LiNbO₃

3) The rutile titanium di-oxide possesses following attributes: 1 point

- It has tetragonal crystal structure.
- Half of the octahedral voids are filled.
- Quarter of the tetrahedral voids are filled.
- It has hexagonal crystal structure.

No, the answer is incorrect.

Score: 0

Accepted Answers:

It has tetragonal crystal structure.

Half of the octahedral voids are filled.

4) Non-crystalline materials have a broad glass transition temperature. This is primarily due to 1 point

- varying bond lengths.
- multiple crystal structures.
- varying bond energy.
- presence of secondary bonds.

No, the answer is incorrect.

Score: 0

Accepted Answers:

varying bond lengths.

varying bond energy.

5) Addition of impurities to silica leads to the following: 1 point

- Lowering the viscosity.
- Lowering of glass transition temperature.
- Improvement in the crystallinity.
- Improvement in the conductivity.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Lowering the viscosity.

Lowering of glass transition temperature.

6) Which of the following is/are 3-dimensional silicate(s)? 1 point

- Hemimorphite
- Beryl
- Asbestos
- Quartz

No, the answer is incorrect.

Score: 0

Accepted Answers:

Quartz

7) Consider the 2-dimensional sheet like structure of silica such as Mica. In such case, the number of oxygen atoms shared between the SiO₄ tetrahedrons are 1 point

- one
- two
- two and half
- three

No, the answer is incorrect.

Score: 0

Accepted Answers:

three

8) Which of the following order of materials correctly represents the glass transition temperatures in ascending order (lower to higher)? 1 point

- fused silica < vycor glass < window glass < pyrex glass
- window glass < pyrex glass < vycor glass < fused silica
- vycor glass < window glass < pyrex glass < fused silica
- window glass < fused silica < vycor glass < pyrex glass

No, the answer is incorrect.

Score: 0

Accepted Answers:

window glass < pyrex glass < vycor glass < fused silica

9) The side group in polystyrene is: 1 point

- H, H, H, H
- H, H, H, C₆H₅
- H, H, H, CH₃
- H, H, H, Cl

No, the answer is incorrect.

Score: 0

Accepted Answers:

H, H, H, C₆H₅

10) The weight in amu of a polyethylene chain with 1000 mers is (atomic weights C: 12, H: 1) 1 point

- 28,000
- 280,000
- 62,000
- 42,000

No, the answer is incorrect.

Score: 0

Accepted Answers:

28,000

11) Which of the following materials soften(s) with increase in temperature? 1 point

- Phenolic resin
- Bakelite
- Polystyrene
- Polyethylene

No, the answer is incorrect.

Score: 0

Accepted Answers:

Polystyrene

Polyethylene

12) Crystal structure of crystalline form of polyethylene is 1 point

- cubic
- tetragonal
- orthorhombic
- hexagonal

No, the answer is incorrect.

Score: 0

Accepted Answers:

orthorhombic

13) The degree of polymerization in polypropylene is 25,000. The average molecular weight in amu is 1 point

- 650,000
- 1,400,000
- 1,050,000
- 1,950,000

No, the answer is incorrect.

Score: 0

Accepted Answers:

1,050,000

14) Following are the attributes of elastomers: 1 point

- They are long chain molecules with cross linking.
- They possess substantial transverse mobility.
- They exhibit rubber like behaviour at room temperature.
- They are long chain molecules without cross linking.

No, the answer is incorrect.

Score: 0

Accepted Answers:

They are long chain molecules with cross linking.

They exhibit rubber like behaviour at room temperature.

15) Polymethylmethacrylate (PMMA) is used as: 1 point

- dashboard
- plexiglass
- bearing
- bumper

No, the answer is incorrect.

Score: 0

Accepted Answers:

plexiglass