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NPTEL

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Courses » Symmetry and Structure in the Solid State

Announcements **Course** Ask a Question Progress FAQ

Unit 12 - Basics of X Ray Diffraction 2

Register for
Certification exam

Course outline

How to access
the portal

Basics of
Symmetry 1 :
Generation of
Point Groups

Basics of
Symmetry 2:
Detailed
Understanding
of 32 Point
Groups

Assignment of
Point Groups to
Crystal Systems
and Bravais
Lattice

Basics of
Symmetry 4:
Space Group
Description And
Introduction to
the International
Tables of
Crystallography(ITC-
Vol. A).

Correlation
Between
Symmetry
Diagrams and

Week 8 - Assignment 8

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-03-27, 23:59 IST.**

1) What is the volume of the unit cell(Angstrom cube) of a monoclinic system with $a=10$ Angstrom, $b=5$ Angstrom, $c=20$ Angstrom, and $\beta=115$ degrees **2 points**

- 1000
- 906.3
- 1006.3
- 1000.3

No, the answer is incorrect.

Score: 0

Accepted Answers:

906.3

2) Pure Au and pure Cu are both cubic with atoms at $0\ 0\ 0$, $0\ 1/2\ 1/2$, $1/2\ 0\ 1/2$ and $1/2\ 1/2\ 0$. **2 points**
The compound Cu_3Au is also cubic with Au atoms at $0\ 0\ 0$ and Cu atoms at $0\ 1/2\ 1/2$, $1/2\ 0\ 1/2$ and $1/2\ 1/2\ 0$. What is the lattice types of Au, Cu, and Cu_3Au ?

- F, F, F
- F, F, I
- F, F, C
- F, F, P

No, the answer is incorrect.

Score: 0

Accepted Answers:

F, F, P

3) What is the difference in Bragg angle Theta for the α_1 and α_2 reflexions from the **2 points**

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Basics of X Ray Diffraction 1

Basics of X Ray Diffraction 2

Bragg's Law in Reciprocal Space 1

Bragg's Law in Reciprocal Space 2

Calculation of Intensities 1

Calculation of Intensities 2

Conversion from Direct to reciprocal space, the inverse relations

Quiz : Week 8 - Assignment 8

Bragg's Law in Reciprocal Space

Structure Determination Methodologies 1

Structure Determination Methodologies 2

Powder Diffraction Method & Quantum Crystallography

(i) 0.75 degree (ii) 2.55 degree

No, the answer is incorrect.

Score: 0

Accepted Answers:

(i) 0.25 degree (ii) 2.05 degree

4) What is the total number of lattice points associated with each lattice type (i) C, (ii) F, (iii) I, (iv) R(hexagonal axes)? **2 points**

(i) 2, (ii) 4, (iii) 2, (iv) 3

(i) 2, (ii) 3, (iii) 2, (iv) 3

(i) 2, (ii) 1, (iii) 1, (iv) 1

(i) 2, (ii) 3, (iii) 3, (iv) 4

No, the answer is incorrect.

Score: 0

Accepted Answers:

(i) 2, (ii) 4, (iii) 2, (iv) 3

5) What is the relationship between the phase difference and path difference for X-Rays? **2 points**

Path Difference = Phase Difference * 2π

Path Difference = Phase Difference * π

Phase Difference = Path Difference * π

Phase Difference = Path Difference * 2π

No, the answer is incorrect.

Score: 0

Accepted Answers:

Phase Difference = Path Difference * 2π

6) What is the Intensity of a 420 reflexion for a CsCl Molecule, where Cs is at 0,0,0 and Cl is at $1/2, 1/2, 1/2$? [f for Cs is 28 and f for Cl is 7] **2 points**

2809

784

961

1225

No, the answer is incorrect.

Score: 0

Accepted Answers:

1225

7) What is the relationship between Intensity $I(\mathbf{hkl})$ and the Structure Factor $F(\mathbf{hkl})$ for a given reflection? **2 points**

Intensity is Inversely Proportional to Square of Structure Factor

Intensity is Directly Proportional to Square of Structure Factor

Intensity is Directly Proportional to Cube of Structure Factor

None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Intensity is Directly Proportional to Square of Structure Factor

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