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Unit 5 - Week 2 - Crystallography II + Structure of Solids I

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Course outline

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Supplementary Materials

Week 1 - Crystallography I

Week 2 - Crystallography II + Structure of Solids I

- Week 2 Overview
- Week 2 Reading List
- 2.1 Miller Indices of Directions (18)
- 2.2 Miller Indices for Planes (18)
- 2.3 Miller Indices for a plane and its normal in Cubic Crystal (3)
- 2.4 Weiss Zone law and its

Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2019-02-13, 23:59 IST.**

1) All body diagonals of a conventional unit cell of a tetragonal crystal with *c*/*a* ratio=2 is given by: ***1 point***

- [111]
- <111>
- <112>
- (111)

No, the answer is incorrect.
Score: 0

Accepted Answers:
<111>

2) All the members of the symmetry related family of planes {100} in an orthorhombic lattice are given by: ***1 point***

- $(100), (\bar{1}00), (010), (0\bar{1}0), (001), (00\bar{1})$
- $[100], [\bar{1}00]$
- $(100), (\bar{1}00), (010), (0\bar{1}0)$
- $(100), (010), (001)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$[100], [\bar{1}00]$

3) The plane containing the directions [001] and $[1\bar{1}0]$ is ***1 point***

Score: 0

Accepted Answers:

(110)

4) The line of intersection of the planes (111) and $(1\bar{1}0)$ is **1 point**

- $[11\bar{2}]$
- [201]
- [110]
- [111]

No, the answer is incorrect.

Score: 0

Accepted Answers:

$[11\bar{2}]$

5) In Bragg's equation $\lambda = 2d\ \sin\theta$, the angle θ is the angle between **1 point**

- plane normal and the incident beam
- transmitted and diffracted beam
- half the angle between transmitted and diffracted beam
- none of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

half the angle between transmitted and diffracted beam

6) The close packed planes in a ccp crystal are given by {111}. If the stacking sequence is *ABCABCABC*… and the *A* layer is (111), the *B* layer will be: **1 point**

- (111)
- $(11\bar{1})$
- (100)
- Both a and b

No, the answer is incorrect.

Score: 0

Accepted Answers:

(111)

7) Which of the following stacking sequences will give rise to close packed structures? **1 point**

P: *ABCABCABC...*
Q: *ABABAB...*
R: AABBAABB...
S: ABCBCABCBC...

- P and Q only
- P, Q and R
- P, Q and S
- P and R only

No, the answer is incorrect.

Score: 0

Accepted Answers:

Week 12 - Mechanical Behaviour of Materials III + Fracture

Interactive Session

P, Q and S

8) The lattice parameter *c* and *a* of an HCP crystal are related to the dimensions of the tetrahedral voids in the structure. Choose the correct statement: ***1 point***

- *c* is the height of the tetrahedron and *a* is the edge length of the tetrahedron
- *c* is the edge length of the tetrahedron and *a* is the height of the tetrahedron
- *c* is two times the edge length of the tetrahedron and *a* is the height of the tetrahedron
- *c* is two times the height of the tetrahedron and *a* is the edge length of the tetrahedron

No, the answer is incorrect.
Score: 0

Accepted Answers:
c is two times the height of the tetrahedron and a is the edge length of the tetrahedron

9) Packing fraction is defined as the volume occupied by the atoms in a unit cell divided by the volume of the unit cell. Let *c* be the packing fraction of ccp and *h* be the packing fraction of hcp. Choose the correct option: ***1 point***

- *c* = *h*
- *c* = 0.74*h*
- *c* < *h*
- *c* = 0.414*h*

No, the answer is incorrect.
Score: 0

Accepted Answers:
c = h

10) The plane normal to the close packed plane in a hcp crystal is along the _____ of the crystal ***1 point***

- two-fold axis
- three-fold axis
- six-fold axis
- four-fold axis

No, the answer is incorrect.
Score: 0

Accepted Answers:
six-fold axis

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