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Courses » Solid State Chemistry

Announcements

Course

Ask a Question

Progress

FAQ

## Unit 4 - Week 2 Unit Cells And Lattices

Register for  
Certification exam

### Course outline

How to access  
the portal

Practice

Week 1 : Solid  
State And Solid  
State Materials

Week 2 Unit  
Cells And  
Lattices

● Lecture 6 : Unit  
Cells

● Lecture 7 :  
Conventional  
Unit Cell &  
Primitive Unit  
Cell

● Lecture 8 :  
Bravais Lattices

● Lecture 9 :  
Bravais  
Lattices, Basis  
& crystal

● Lecture 10 :  
Summary of  
week 2 and  
Practices  
Problems

○ Quiz :  
Assignment 2

## 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) The primitive unit cell of a Bravais lattice must **1 point**

- have exactly one point.
- be the shape of parallelepiped.
- be enclosed by three lattice translation vectors
- be centrosymmetric

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*have exactly one point.*

2) in 2D, the honeycomb lattice is not a Bravais lattice because **1 point**

- it does not satisfy long range order
- it does not fill space
- the orientation of the crystal is not the same at all points.
- it is identical to a rectangular lattice

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*the orientation of the crystal is not the same at all points.*

3) Which of the following shapes is NOT a valid unit cell shape for a 2D Bravais lattice **0 points**

- triangle
- pentagon
- rectangle
- rhombus

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<p><b>Crystals Part 1</b></p> <hr/> <p><b>Week 4 : Symmetry in Crystals Part 2</b></p> <hr/> <p><b>Week 5 : Crystal Systems, Point Groups and Space Groups</b></p> <hr/> <p><b>Week 6 : Crystallographic Notations</b></p> <hr/> <p><b>Week 7 : Coordination number, voids, defects in crystals</b></p> <hr/> <p><b>Interactive Session</b></p> <hr/> <p><b>Week 8 : X-ray Diffraction and Concepts related to X-ray Diffraction</b></p> <hr/> <p><b>Week 9 : X - Ray Diffraction, X - Ray Crystallography &amp; Electron Microscopy</b></p> <hr/> <p><b>Week 10 : Common Crystal Structures</b></p> <hr/> <p><b>Week 11 : Theory of Electronic Structure of Solids</b></p> <hr/> <p><b>Interaction Session</b></p> <hr/> <p><b>Week 12 : Theory of Electronic Structure of Solids, Part 2</b></p>	<p>ce De</p> <p>volume of this unit cell is equal to</p> <p><input type="radio"/> 1</p> <p><input type="radio"/> 3/4</p> <p><input type="radio"/> 1/2</p> <p><input type="radio"/> 2</p> <p><b>No, the answer is incorrect.</b></p> <p><b>Score: 0</b></p> <p><b>Accepted Answers:</b></p> <p>1</p> <p>5) Which of the following is valid choice for the primitive lattice translation vectors of a BCC lattice with a point at the origin? <b>1 point</b></p> <p><input type="radio"/> <math>\vec{a} = \hat{i}, \vec{b} = \hat{j}, \vec{c} = \hat{k}</math></p> <p><input type="radio"/> <math>\vec{a} = \hat{i} + \hat{j}, \vec{b} = \hat{i} - \hat{j}, \vec{c} = \hat{k}</math></p> <p><input type="radio"/> <math>\vec{a} = \hat{i}/2, \vec{b} = \hat{j}/2, \vec{c} = \hat{k}/2</math></p> <p><input type="radio"/> None of the other choices</p> <p><b>No, the answer is incorrect.</b></p> <p><b>Score: 0</b></p> <p><b>Accepted Answers:</b></p> <p><i>None of the other choices</i></p> <p>6) The 3-dimensional hexagonal close packed crystal is <b>1 point</b></p> <p><input type="radio"/> a hcp Bravais lattice</p> <p><input type="radio"/> a triclinic Bravais lattice</p> <p><input type="radio"/> a hexagonal Bravais lattice with a two-atom basis</p> <p><input type="radio"/> none of the other statements</p> <p><b>No, the answer is incorrect.</b></p> <p><b>Score: 0</b></p> <p><b>Accepted Answers:</b></p> <p><i>a hexagonal Bravais lattice with a two-atom basis</i></p> <p>7) The coordination number of an FCC lattice and a BCC lattice are, respectively <b>1 point</b></p> <p><input type="radio"/> 6 and 6</p> <p><input type="radio"/> 6 and 8</p> <p><input type="radio"/> 12 and 8</p> <p><input type="radio"/> None of the others</p> <p><b>No, the answer is incorrect.</b></p> <p><b>Score: 0</b></p> <p><b>Accepted Answers:</b></p> <p><i>12 and 8</i></p> <p>8) A convenient choice of unit cell for the hexagonal Bravais lattice is a parallelepiped with the usual symbols for the sides and angles. The restriction for this lattice is <b>1 point</b></p> <p><input type="radio"/> <math>a = b; \gamma = 120^\circ, \beta = \alpha = 90^\circ</math></p>
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$$a = b \neq c; \gamma = 60^\circ, \beta = \alpha = 90^\circ$$

$$a = b; \alpha = 120^\circ$$

None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$a = b; \gamma = 120^\circ, \beta = \alpha = 90^\circ$$

9) A square lattice is shown below with 4 shaded regions marked A, B, C and D.

1 point

The region(s) corresponding to unit cell(s) is/are

A, B, C and D

A, B and D only

C and B only

C and D only

No, the answer is incorrect.

Score: 0

Accepted Answers:

C and D only

10) The coordination number of sodium ions in a NaCl crystals is equal to

1 point

4

6

8

12

No, the answer is incorrect.

Score: 0

Accepted Answers:

6

Previous Page

End

