Characterization of Materials 635:309

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See due date on Website Syllabus

Print out and answer on this page

1. List the atom positions for the Zn atoms in the crystal given below, in units of axial lengths. (axial length is the fraction along a particular axis and is given below for the atom position in the unit cell).
2. How many formula units of $ZnCl_2$ exist in the unit cell? ANSWER____
3. What does I (in $I\bar{4}2d$) mean in the crystal below?

ANSWER_____

4. How many imaginary lattice points are in the unit cell of this crystal?

ANSWER_____

5. List the locations of these imaginary lattice points (also called point lattice or space lattice) in this unit cell.

ANSWER_____

6. How many atoms are in the unit cell in this crystal? ANSWER_____
7. What is the Bravais Lattice of this crystal (full name)? ANSWER_____
8. What does the $\bar{4}$ in $I\bar{4}2d$ mean? ANSWER_____

α-$ZnCl_2$

Tetragonal, space group $I\bar{4}2d$, No. 122; a = 5.398Å, c= 10.33Å; Z = 4; V = 300.99Å^3

Atomic Positions:

Zn in 4(*a*):	0,0,0; 0,1/2,1/4; bct (bct usually seen as only bc in many tables)
Cl in 8(*d*):	x,1/4,1/8; $\bar{x}$, 3/4,1/8; 3/4, x,7/8; 1/4, $\bar{x}$, 7/8; bct; x = 0.25

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