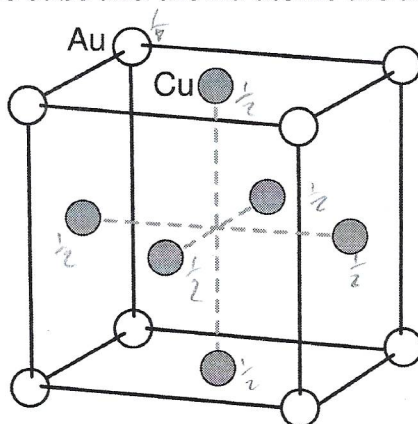(+3)

Name: _Sherrie Wong_

Shown below is the cubic unit cell of an alloy between copper (Cu) and gold (Au), where the Cu atoms are on the faces of the cube and the Au atoms are at the corners of the cube.



1. Determine the ratio of Cu:Au by calculating how many copper and gold atoms are present in the unit cell.
2. Is the crystal structure of this alloy face-centered cubic (fcc)? Explain your answer in one sentence.

1. Copper: $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 3$ atoms

   Gold: $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = 1$ atom
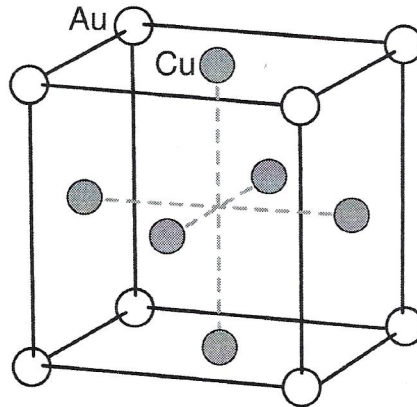
   Ratio of Cu:Au = 3:1 ✓

2. This structure appears face-centered cubic because there is an atom packed at the center of each face. However, the atoms at the center of each face and the corner atoms are different elements, so it is packed a bit differently than a pure element fcc.

   +1 ✓

(+3)

Name: _Kayley delay_

Shown below is the cubic unit cell of an alloy between copper (Cu) and gold (Au), where the Cu atoms are on the faces of the cube and the Au atoms are at the corners of the cube.



1. Determine the ratio of Cu:Au by calculating how many copper and gold atoms are present in the unit cell.
2. Is the crystal structure of this alloy face-centered cubic (fcc)? Explain your answer in one sentence.

1. $(\frac{1}{2})(6) = 3$ Cu atoms

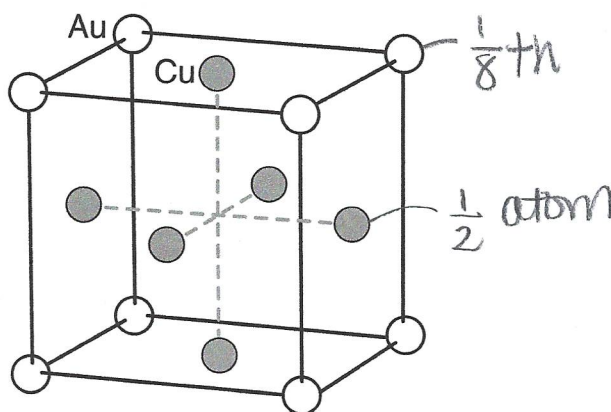   $(\frac{1}{8})(8) = 1$ Au atoms

   Total 4 atoms

   3 Cu atoms : 1 Au atom ✓

2. The crystal structure of this alloy is not ✓ face-centered because Au and Cu are not the same atom so they will pack differently then fcc.

(+3)

Name: Vanessa Blas

Shown below is the cubic unit cell of an alloy between copper (Cu) and gold (Au), where the Cu atoms are on the faces of the cube and the Au atoms are at the corners of the cube.



1. Determine the ratio of Cu:Au by calculating how many copper and gold atoms are present in the unit cell.
2. Is the crystal structure of this alloy face-centered cubic (fcc)? Explain your answer in one sentence.
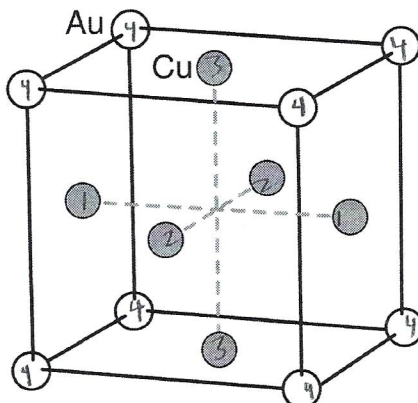
Cu has 3 atoms : Au has 1 atom/cell

1) 3:1 ✓

2) This alloy is not face-centered because the atoms are not identical; Au is simple cubic and the Cu atoms just fill in the empty spaces.

(+3)

Name: _____Cathy Duong_____

Shown below is the cubic unit cell of an alloy between copper (Cu) and gold (Au), where the Cu atoms are on the faces of the cube and the Au atoms are at the corners of the cube.
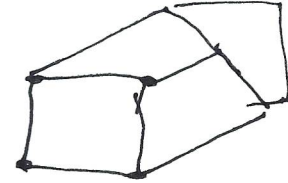


1. Determine the ratio of Cu:Au by calculating how many copper and gold atoms are present in the unit cell.   3: 1  ✔

2. Is the crystal structure of this alloy face-centered cubic (fcc)? Explain your answer in one sentence.

   No because the atoms need to be identical ✔ for the crystal structure to be considered fcc, but Au atoms ≠ Cu atoms.

(+3)

Name: _Nicholas DeLuca   12/4/18_

Shown below is the cubic unit cell of an alloy between copper (Cu) and gold (Au), where the Cu atoms are on the faces of the cube and the Au atoms are at the corners of the cube.
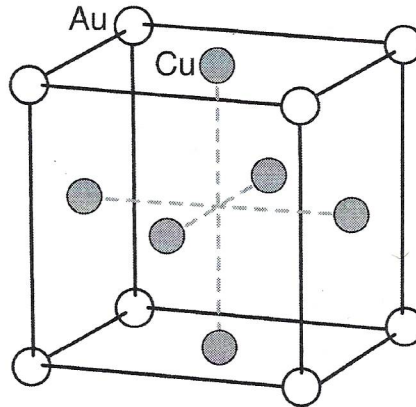
Au    Cu

1.  Determine the ratio of Cu:Au by calculating how many copper and gold atoms are present in the unit cell.  [3:1]  ✓   $\frac{6}{2} = 3$ : $8(\frac{1}{8}) = 1$

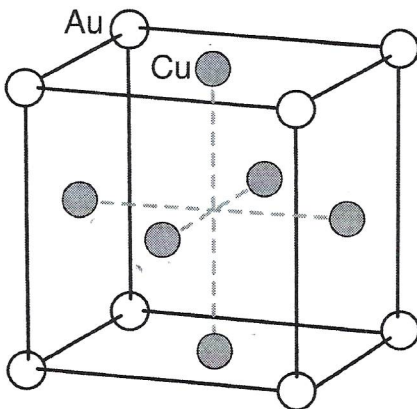2.  Is the crystal structure of this alloy face-centered cubic (fcc)? Explain your answer in one sentence.

    No, the Au atoms determine the crystal structure and therefore the lattice is simple cubic, because gold fits into the interstitial holes. ✓

(+3)

Name: _____Jose Key_____

Shown below is the cubic unit cell of an alloy between copper (Cu) and gold (Au), where the Cu atoms are on the faces of the cube and the Au atoms are at the corners of the cube.



1. Determine the ratio of Cu:Au by calculating how many copper and gold atoms are present in the unit cell.
2. Is the crystal structure of this alloy face-centered cubic (fcc)? Explain your answer in one sentence.

1) 3:1   Cu to Au ✓

2) No, because all of the atoms present are not the same. ✓