

## Quiz 11.4 – Solids and Crystal Structure

Name: \_\_\_\_\_

**Question 1**

Classify the following solids in as many ways as you can:

Quartz Crystal

Naphthalene

Aluminum Foil

Glass

Iron(III) Oxide

**Question 2**At room temperature, iron has a body-centered cubic structure. Iron atoms have a radius of  $126\text{ pm}$ 

- Give the coordination number of the iron atoms
- Find the length of the edge of a unit cell
- Estimate the density of iron metal. (The observed value is  $7.87\frac{\text{g}}{\text{cm}^3}$ )

**Question 3**Lead has a face-centered cubic structure, and a density of  $11.34\frac{\text{g}}{\text{cm}^3}$ 

- Give the coordination number of the lead atoms
- Find the length of the edge of a unit cell
- Estimate lead's atomic radius. (The observed value is  $175\text{ pm}$ )

## *Caged Bird*

By Maya Angelou

A free bird leaps  
on the back of the wind  
and floats downstream  
till the current ends  
and dips his wing  
in the orange sun rays  
and dares to claim the sky.

But a bird that stalks  
down his narrow cage  
can seldom see through  
his bars of rage  
his wings are clipped and  
his feet are tied  
so he opens his throat to sing.

The caged bird sings  
with a fearful trill  
of things unknown  
but longed for still  
and his tune is heard  
on the distant hill  
for the caged bird  
sings of freedom.

The free bird thinks of another breeze  
and the trade winds soft through the sighing trees  
and the fat worms waiting on a dawn bright lawn  
and he names the sky his own

But a caged bird stands on the grave of dreams  
his shadow shouts on a nightmare scream  
his wings are clipped and his feet are tied  
so he opens his throat to sing.  
The caged bird sings  
with a fearful trill  
of things unknown  
but longed for still  
and his tune is heard  
on the distant hill  
for the caged bird  
sings of freedom.