Quiz 12.4 – 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 $126\ pm$

- Give the coordination number of the iron atoms

- Find the length of the edge of a unit cell

- Estimate the density of iron metal. $\left(\text{The observed value is } 7.87\ \dfrac{g}{cm^3}\right)$

Question 3

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

- Give the coordination number of the lead atoms

- Find the length of the edge of a unit cell

- Estimate lead's atomic radius. $\left(\text{The observed value is } 175\ pm\right)$

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.