

Preliminary Quiz Solids
Are you proficient Version A

1. Which of the above substances are molecular?

CCl₄ N₂ He (atom) (molecule)

2. Which of the above substances is an ionic bulk crystal?

CaCl₂ LiCl

3. Which of the above substances is a network covalent?

Graphite SiC

4. A local farmer's dog has died unexpectedly, and he thought his dog may have been poisoned. A common poison to dogs is ethylene glycol: C₂H₆O₂. Note: Ethylene glycol is commonly used as antifreeze. It has an unusually sweet taste and animals can inadvertently drink.

a. What is the percent mass of each element for this compound?

C: $24/62 \times 100 = 38.7$ H: $6/62 \times 100 = 9.6\%$

O: $32/62 \times 100 = 51.6\%$

b. A chemist analyzed the animal and found it to have an unusually high concentration of a chemical that is 27.27% C and 73.7% O. What would be the empirical formula of this substance? Should the person dismiss this chemical?

CO₂

$\frac{27.27}{12.0} = 2.27/2.27 = 1$

$\frac{73.7}{16.0} = 4.6/2.27 = 2$

c. The molecular weight of this unknown compound is 88g/mol. What is the unknown substance? Do a quick internet search, is this substance poisonous and could a dog have eaten this accidentally or was it poisoned?

CO₂ = 44g/mol
12 32

$\frac{88}{44} = 2$

C₂O₄

Melting points °C	
Graphite	4200
SiC	2700
CaCl ₂	1650
LiCl	610
CCl ₄	-39
N ₂	-210
He	-272

Preliminary Quiz: Solids Vb

1. There are three Chlorides in this list:

LDF Ionic

a. What is being broken in CCl₄ vs LiCl?

b. Why is CaCl₂ significantly bigger than LiCl?

Size of Charges

2. Which will have the higher melting point, explain? (AlCl₃ or KCl)

Size of Charges

+3/-1
+1/-1

3. A customer has her furnace checked and a sample of clear colorless gas has been detected and analyzed. Empirical formula

C: 27.7%

O: 75.7%

$27.7/12 = 2.30 \text{ mol} / 2.3 = 1$

$75.7/16 = 4.7 \text{ mol} / 2.3 = 2$

CO₂

The customer is concerned the gas is Carbon monoxide... should she have her furnace repaired?

No it is CO₂

Melting points °C	
Graphite	4200
SiC	2700
CaCl ₂	1650
LiCl	610
CCl ₄	-39
N ₂	-210
He	-272