

1. (7 points) *Elements and Atoms*

The element bromine is a (metal, nonmetal, metalloid) \_\_\_\_\_. Its atomic number is \_\_\_\_\_ and its atomic weight is \_\_\_\_\_. An atom of bromine has \_\_\_\_\_ protons and \_\_\_\_\_ electrons. An isotope of bromine, bromine-80, has \_\_\_\_\_ neutrons. The bromide ion ion has \_\_\_\_\_ electrons.

2. (10 points) *Naming Compounds. Formulas of Compounds*

Name	Cation	Anion	Formula
Ammonium carbonate			
Iron(III) oxide			
	K <sup>+</sup>	CH <sub>3</sub> CO <sub>2</sub> <sup>-</sup>	
			NiSO <sub>4</sub>

3. (3 points) How many moles does are represented by 35.5 g of mercury, Hg?

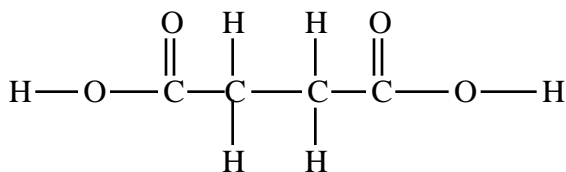
- a) 201 mol                      c) 5.65 mol  
 b) 14.6 mol                     d) 0.177 mol

4. (3 points) An ornament for a car is iron coated with chromium. If the chromium coating is 0.015 mm thick, and the object has a surface area of 15.3 cm<sup>2</sup>, how many atoms of chromium are there in the chromium coating? (density of chromium = 7.19 g/cm<sup>3</sup>)

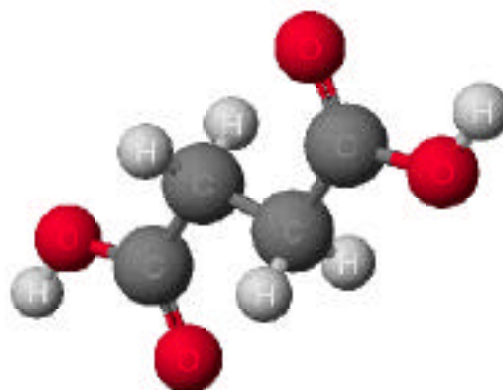
- a)  $3.70 \times 10^{19}$  atoms  
 b)  $1.91 \times 10^{21}$  atoms  
 c)  $8.33 \times 10^{22}$  atoms  
 d)  $1.27 \times 10^{24}$  atoms  
 e) None of the above?  
 f) Help!

## 4. (7 points) Formulas

The structure of the acid succinic acid is illustrated here.



Structural formula of succinic acid



Molecular model of succinic acid

Succinic acid is a naturally occurring acid, found in lichens and fungi. It is manufactured from acetic acid and is used in making dyes and perfumes.

- The molar mass of succinic acid is \_\_\_\_\_
- The empirical formula of the compound is \_\_\_\_\_
- If you have 1.56 g of succinic acid, how many moles of the acid do you have? *For the following calculation, you must show your work!*