

CHEM 101-072
Work Sheet II (Atoms, Molecules, and Ions)
15 and 17 March, 2009

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I) A reaction of 1 L of chlorine gas (Cl_2) with 3 L of fluorine gas (F_2) yields 2 L of a gaseous product. All the gasses are at the same temperature and pressure. What is the formula of the gaseous product?

II) Calculate the densities of a hydrogen nucleus and a hydrogen atom.

$$m_{\text{proton}} = m_{\text{neutron}} = 1.67 \times 10^{-27} \text{ kg}$$

$$m_{\text{electron}} = 9.11 \times 10^{-31} \text{ kg}$$

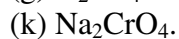
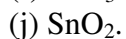
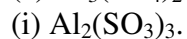
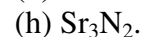
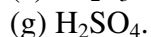
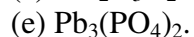
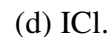
$$\text{radius of the nucleus} = 5 \times 10^{-14} \text{ cm}$$

$$\text{radius of the hydrogen atom} = 1 \times 10^{-8} \text{ cm}$$

III) Complete the following table:

Symbol	# of protons	# of neutrons	# of electrons	Net charge
${}^{53}_{26}\text{Fe}^{2+}$				
	26	33		3+
	13	14	10	
		76	54	2-

IV) Name each of the following compounds:



V) Write the formula for each of the following:

