

Unit 1 Practice Problems (with answers at end)

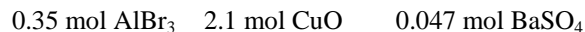
The constant winds of petty appetite dissipate the power of response.--George Sand

Molar mass

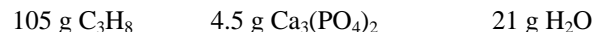
1. For each of the following compounds calculate the molar or formula mass (i.e., grams/mol):



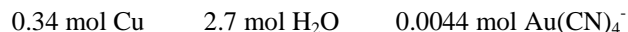
2. In each case convert the mole quantity given into grams:



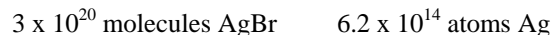
3. Convert each gram quantity given below into moles:



4. In each case, change the moles of the substance given into atoms or molecules (remember, the process is identical--atoms are for elements and molecules for compounds)



5. For the atoms or molecules below, convert to moles:

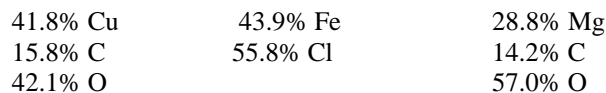


% composition by mass and empirical formulas

6. For each of the following, calculate the % composition, by mass, of each element in the compound:



7. For the given data, determine the empirical formula:



When one has been threatened with a great injustice, one accepts a smaller as a favor.--Jane Carlyle

Nomenclature

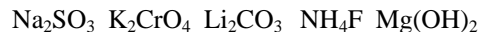
8. The following are binary compounds made up of metals and non-metals. Name them.



9. The following are binary compounds made up of non-metals only. Name them.



10. The following are ternary or higher compounds. Name them.



11. The following is a mixture of all three types of compounds. Write correct formulas for them.

potassium permanganate
sodium bromide
ammonium dichromate
dinitrogen trioxide
iron(II) phosphate

Answers

1. 208.3, 303.5, 126.1, 98.0, 132.0

2. 93, 170, 11

3. 2.39, 0.015, 1.2

4. 2.0×10^{23} , 1.6×10^{24} , 2.6×10^{21}

5. 5×10^{-4} , 1.0×10^{-9}

6.	CaSO ₄	CuO	(NH ₄) ₂ SO ₄
	29.4% Ca	79.9% Cu	21.2% N
	23.6% S	20.1% O	6.1% H
	47.0% O		24.3% S
			48.5% O

7. CuC₂O₄, FeCl₂, MgCO₃

8. sodium sulfide, iron(II) bromide, potassium nitride, lithium sulfide,
chromium(III) chloride

9. chlorine trifluoride, disulfur dichloride, tetrarsenic hexoxide, triphosphorus
pentanitride, arsenic trichloride

10. sodium sulfite, potassium chromate, lithium carbonate, ammonium fluoride,
magnesium hydroxide

11. KMnO₄, NaBr, (NH₄)₂Cr₂O₇, N₂O₃, Fe₃(PO₄)₂