

CHEM 101A**TOPIC A SELECTED ANSWERS**

These selected answers are provided to help you check your work as you do the homework. Do not simply copy the answer and hand it in; you will be expected to show work for all homework problems that you turn in. Detailed solution keys will also be posted, but may not be available until after the assignment is due.

1) 1) Note that this should be review!

- a) Na_2SO_4 b) Fe_2O_3 c) $\text{Zn}(\text{NO}_3)_2$ d) AlI_3

2) Note that this should be review!

- a) calcium fluoride b) potassium phosphate c) copper(II) carbonate
d) sulfuric acid (“hydrogen sulfate” is not used) e) silver sulfide

3) This should be review!

- a) 0.04959 mol b) 0.3471 mol c) 2.389×10^{23} atoms
d) 5.157 g e) 5.972×10^{22} ions

Notes on rounding and significant figures in stoichiometric calculations: In our solution keys, we use four sig fig atomic weights (as given in the periodic table in the inside front cover of the textbook), and we do not round the resulting molar masses unless they are the final answer. In multiple-step calculations, we keep extra digits, rounding only at the final answer. Unless we specify otherwise, all final answers are rounded in accordance with the significant figure rules.

4) This should be review! 8.1130%

5) This should be review!

- a) 0.7554 g b) 13.2 g c) 7.1 g Al (Did you determine the limiting reactant?)
d) 26.5 g

6) This should be review! 443 kg of $\text{Mg}_3(\text{PO}_4)_2$.

7) This should be review!

- a) 3.886 g of H_2SO_4 b) 86.74%

8) 23.86%.

9) C_3H_5

10) a) $\text{C}_3\text{H}_7\text{N}_2\text{O}$ b) $\text{C}_6\text{H}_{14}\text{N}_4\text{O}_2$

11) $\text{C}_7\text{H}_{11}\text{NO}_2\text{S}$

12) If you can't think of an “elegant” way to solve this problem, use trial and error! You know that there are only five options for the mystery “element X”. Pick one of them, do some stoichiometry, and see if the numbers work (if you start with 275 mg of AlX_3 , do you really make 581 mg of AgX ?).

13) The compound is VBr_4 . Start with the second reaction – how much Br_2 must this reaction have used?

14) This problem can only be solved using some trial and error. Guess one of the possible chemical formulas, work out the molar mass of M based on that formula, and see if that corresponds to one of the lanthanides. If it doesn't, try a different chemical formula.... The final answer will be given on the full solutions key.

Optional challenge problem: 87.0% Mg and 13.0% Al.