To get the most out of this Practice Exam:

- Feel free to use a periodic table, scrap paper, and a non-programmable calculator, but do not use your textbook or lecture notes.
- Set a timer for 50 minutes (the amount of time you'll have for the exam). When the time is up, grade yourself using the **Answer Key** on page 8. It is important to get a sense of the length of time you'll have for the exam. If you are doing well on the questions you complete, but aren't getting to the end of the practice exam, see if you can find areas where you can speed up by practicing.
- Each question is worth 4 pts. If you earn < 73% (less than a "C") you are not yet ready to pass Exam #2.
- Complete the **Practice Exam – Self Reflection** on page 9. It will help you identify your strength/weaknesses and possible resources for getting help.
- Print out one copy of **Practice Exam – Correction Template** on page 10 for each question you get wrong. Use the space on the page to analyze your mistake.
- Get help and/or extra practice with questions you don't understand.

Soluble salts include:	
• All Li^+, Na^+, K^+, NH_4^+, NO_3^- and $C_2H_3O_2^-$	
• All SO_4^{2-}	except: Ca^{2+}, Sr^{2+}, Ba^{2+}, Pb^{2+}
• All Cl^-, Br^-, and I^-	except: Ag^+, Pb^{2+}, Hg_2^{2+}
Insoluble salts include:	
• All PO_4^{3-} and CO_3^{2-}	except: Li^+, Na^+, K^+, and NH_4^+
• All OH^- and S^{2-}	except: Li^+, Na^+, K^+, NH_4^+, Ca^{2+}, Sr^{2+}, and Ba^{2+}

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1) What is the mass of 0.85 mol of Cu?

A) 37 g **B)** 15 g **C)** 0.013 g **D)** 0.23 g **E)** 54 g

2) What is the net ionic reaction when aqueous Na_3PO_4 reacts with aqueous $FeCl_2$?

A) $3\ Na^+(aq) + PO_4^{3-}(aq) \rightarrow Na_3PO_4(s)$ **B)** $3\ Fe^{2+}(aq) + 2\ PO_4^{3-}(aq) \rightarrow Fe_3(PO_4)_2(s)$

C) $Fe^{2+}(aq) + PO_4^{2-}(aq) \rightarrow FePO_4(s)$ **D)** $Fe^{2+}(aq) + 2\ Cl^-(aq) \rightarrow FeCl_2(s)$

E) no reaction (N.R.)

3) What is the coefficient in front of the CO_2 when the following reaction is balanced?

_____ Fe_2O_3 + _____ $CO \rightarrow$ _____ Fe + _____ CO_2

A) 2 **B)** 3 **C)** 4 **D)** 5 **E)** 6

4) How many moles are there in 1.90 kg of $Pb(ClO_2)_4$?

A) 3.98 mol **B)** 0.0156 mol **C)** 906 mol **D)** 0.00398 mol **E)** 15.6 mol

5) A sample of ammonia (NH_3) contains 2.5×10^{24} H atoms. What is the mass of the sample?
Note: 1 mol = 6.02×10^{23} things

A) 1.4 g **B)** 24 g **C)** 27 g **D)** 0.28 g **E)** 71 g

6) What is the mass percent of O in sodium carbonate?

A) 15.10% **B)** 45.29% **C)** 41.38% **D)** 30.20% **E)** 49.45%

7) Which of the following compounds is not expected to be soluble in water?

A) CuCl **B)** $(NH_4)_3PO_4$ **C)** KOH **D)** $Fe_2(CO_3)_3$ **E)** $NiSO_4$

8) What is the molar mass (in g/mol) of silver chromate? Report your answer to 4 significant figures.

A) 199.0 **B)** 563.2 **C)** 604.3 **D)** 480.6 **E)** 331.8

9) A sample of $Fe_2(Cr_2O_7)_3$ contains 14.5 g of Cr. How many g of Fe are in the sample?

A) 1.77 g **B)** 46.7 g **C)** 0.467 g **D)** 5.19 g **E)** 31.2 g

10) What is the coefficient in front of the CO_2 when the following reaction is balanced?

_____ $K_3C_6H_5O_7$ + _____ CO_2 + _____ $H_2O \rightarrow$ _____ $H_3C_6H_5O_7$ + _____ $KHCO_3$

A) 3 **B)** 4 **C)** 5 **D)** 6 **E)** 7

11) What is the coefficient in front of the H_2O when the following reaction is balanced? "aqueous magnesium hydroxide reacts with aqueous carbonic acid to produce aqueous magnesium carbonate and water"

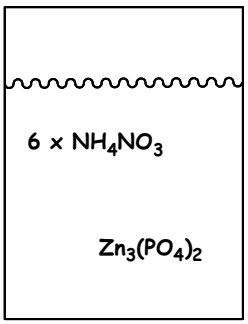
A) 1 **B)** 2 **C)** 3 **D)** 4 **E)** 5

12) A 12.66 g sample of C reacts with H to form a 15.85 g sample of a carbon-hydrogen compound. What is the empirical formula of the compound?

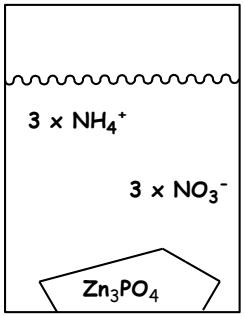
A) CH **B)** C_2H_3 **C)** C_3H_4 **D)** CH_3 **E)** C_2H_5

13) Which of the following beakers is the best representation for what happens when you combine aqueous solutions of $Zn(NO_3)_2$ and $(NH_4)_3PO_4$?

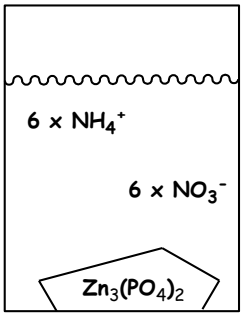
A)



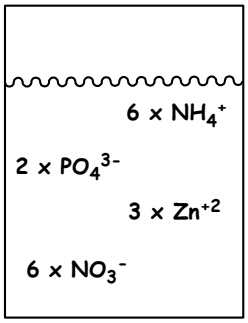
B)



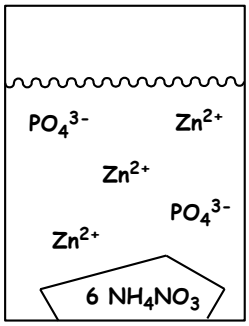
C)



D)



E)



14) An unknown compound is 78.65% C, 8.25% H, and 13.10% O. What is its empirical formula?

A) C_7H_9O **B)** C_5H_8O **C)** $C_4H_7O_2$ **D)** $C_8H_{10}O$ **E)** $C_4H_7O_5$

15) How many moles of ethanol (C_2H_5OH) are in a 3.50 L sample of ethanol? Note: 1 L = 1000 cm^3 and the density of C_2H_5OH = 0.789 g/cm^3

A) 0.541 mol **B)** 61.7 mol **C)** 2.84 x 10^3 mol **D)** 59.9 mol **E)** 335 mol

16) A sample of iron ore contains 1.02 x 10^{24} Fe atoms and is found to be 69.94% Fe by mass. What is the mass of the sample? Note: 1 mol = 6.02 x 10^{23} things

A) 1.63 g **B)** 163 g **C)** 135 g **D)** 98.0 g **E)** 20.6 g

17) Which of the following has the smallest mass percent P?

A) H_3P **B)** H_3PO_3 **C)** H_3PO_4 **D)** Na_3PO_3 **E)** Na_3PO_4

18) When the reaction for the combustion of nonane (C_9H_{20}) is balanced, what is the smallest, whole number coefficient in front of the CO_2?

A) 7 **B)** 8 **C)** 9 **D)** 10 **E)** 11

19) A 1.8 mole sample of a compound weighs 195 g and is found to be 11.18% H and 88.82% C. What is the molecular formula for the compound?

A) C_2H_3 **B)** C_3H_{18} **C)** C_6H_9 **D)** C_8H_{12} **E)** C_4H_6

20) What is the formula of the solid that is formed when an aqueous solution of zinc chloride is added to an aqueous solution of sodium sulfide?

A) NaCl **B)** ZnS **C)** Zn_2S_3 **D)** $ZnCl_2$ **E)** Zn_3S_2

21) Which of the following is expected to result in the formation of a gas when added to NaOH?

A) K_2CO_3 **B)** H_2SO_3 **C)** NH_4Cl **D)** H_2SO_4 **E)** $KHCO_3$

22) How many atoms are there in 3.0 g of CH_4? Note: 1 mol = 6.02×10^{23} things

A) 1.1×10^{23} **B)** 5.6×10^{23} **C)** 2.3×10^{22} **D)** 4.2×10^{23} **E)** 9.0×10^{24}

23) What products are formed when K_2CO_3 (aq) is mixed with HI (aq)?

A) KI(aq), H_2CO_3(g) **B)** KI(aq), H_2CO_3(aq)

C) KI(aq), H_2(g), CO_3(g) **D)** KI(aq), H_2O(l), CO_2(g)

E) KI(aq), $KHCO_3$(aq)

24) What description applies to the reaction: $2\ Al(s) + Fe_2O_3(aq) \rightarrow Al_2O_3(s) + 2\ Fe(l)$

A) synthesis **B)** single displacement

C) double displacement **D)** decomposition

25) What description applies to the reaction: $2\ Al(s) + Fe_2O_3(aq) \rightarrow Al_2O_3(s) + 2\ Fe(l)$

A) precipitation **B)** combustion

C) oxidation-reduction **D)** acid-base

Answer Key: Each question is worth 4 points

1) E	5) B	9) D	13) C	17) E	21) C	25) C
2) B	6) B	10) A	14) D	18) C	22) B	
3) B	7) D	11) B	15) D	19) D	23) D	
4) A	8) E	12) D	16) C	20) B	24) B	

Practice Exam – Self Reflection

A) What grade did you earn on this practice exam?

B) Are you satisfied with your grade on this practice exam? YES _____ NO _____

C) What is your current grade in CHEM 4? (check Canvas)

D) Are you satisfied with your current grade in CHEM 4? YES _____ NO _____

E) Why do you think you made mistakes on this practice exam? *[Check all that apply.]*

- ☐ Did not study enough
- ☐ Difficulty with the mathematics
- ☐ Did not understand the concepts
- ☐ Felt rushed during the exam
- ☐ Family/personal issues
- ☐ Other (explain):
- ☐ Unfamiliar with terminology
- ☐ Difficulty applying the concept to new contexts
- ☐ Careless mistakes
- ☐ Thought I knew the material better than I did
- ☐ Test anxiety/panicked

F) Which of these resources have you been taking advantage of? *[Check all that apply.]*

- ☐ PAL sessions
- ☐ PAL leader office hours
- ☐ Instructor office hours
- ☐ Commit to Study mentoring
- ☐ Review posted clicker questions
- ☐ Study groups
- ☐ Practice exams
- ☐ Optional *MasteringChemistry* homework
- ☐ PARC tutoring
- ☐ Other (explain):

G) Discuss your weakness and strengths in terms of your study skills and how you approached the class up until taking this practice exam <u>and</u> discuss any changes you plan on making moving forward.

a. Strengths:

b. Weaknesses:

c. Changes you plan on making (be as specific as possible):

Practice Exam – Correction Template

(print out 1 copy of this template for each question you got wrong)

1) What question # from the practice exam are you correcting?

2) What concepts are being dealt with in the question? In other words, what type of problem is it?

3) Where in your textbook (what page) and when in your lecture notes (what date) is this type of problem dealt with?

Part I: Working a similar problem to the one you got wrong

4) Write out a similar problem and all the work needed for you to fully understand it. [Continue on back as needed.]

Part II: Correcting the problem you got wrong

5) Write out the question that you got wrong and all the work needed for you to fully understand it. Include clarifying/explanatory comments. [Continue on back as needed.]