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 6. 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 5 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 7. 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 8 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.

Potentially useful information:

1 m = 39.37 in. 1 in. = 2.54 cm (exactly) 1 mile = 5280 ft = 1.609 km	1 L = 1000 cm^3 = 1.057 qt 1 gal = 4 qt = 8 pt = 3.785 L 1 gal = 128 fluid ounces	1 kg = 2.205 lb 1 lb = 16 oz = 453.6 g
1 cal = 4.184 J 1 Cal = 1000 cal °C = (°F – 32)/1.8 K = °C + 273	density (ethanol) = 0.789 g/cm^3 density (copper) = 8.92 g/cm^3 density (zinc) = 7.14 g/cm^3	C (water) = 4.18 J/g°C C (lead) = 0.128 J/g°C C (copper) = 0.385 J/g°C C (aluminum) = 0.903 J/g°C

1) What is the formula for cobalt(II) dichromate?

A) $CoCr_2O_4$ B) $Co(CrO_4)_2$ C) $CoCr_2O_7$
D) $Co_2Cr_2O_7$ E) $CoCr_2O_8$ F) $CoCrO_4$

2) What is the name of $Fe_2(SO_3)_3$?

A) iron(II) sulfite B) iron(II) sulfate C) iron(III) hyposulfite
D) diiron trisulfate E) iron(II) sulfide F) iron(III) sulfite

3) What is the formula mass of zinc dihydrogen phosphate?

A) 179.7 amu B) 179.72 amu C) 179.721 amu
D) 259.4 amu E) 259.36 amu F) 259.362 amu

4) What is the formula mass of nitrous acid?

A) 47.0 amu B) 47.02 amu C) 47.018 amu
D) 63.0 amu E) 63.02 amu F) 63.018 amu

5) How many significant figures are in the following measurements: 0.004000 and 18.00000

A) 7 and 7 B) 4 and 7 C) 1 and 7
D) 7 and 2 E) 1 and 2 F) 4 and 2

6) What metric prefix goes with the exponent, 10^{-9}?

A) femto B) micro C) giga
D) tera E) nano F) pico

7) How many pL are in 3.0×10^{-5} dL?

A) 3.0×10^{-16} pL B) 3.0×10^{6} pL C) 3.0×10^{8} pL
D) 3.0×10^{-18} pL E) 3.0×10^{3} pL F) 3.0×10^{16} pL

8) Report the answer to this calculation to the correct sig figs: 47.2 + 58 + 6.3401

A) 1.1×10^{2} B) 112 C) 111.5
D) 111.54 E) 111.540 F) 111.5401

9) Calculate the answer with the correct significant figures: (0.54)(104.60) + (0.46)(106.59)

A) 100 B) 1×10^2 C) 1.1×10^2

D) 106 E) 105.5 F) 105.52

10) How many m^2 are in 0.450 ft^2?

A) 0.042 m^2 B) 1.65 m^2 C) 0.14 m^2

D) 0.137 m^2 E) 1.6 m^2 F) 0.0418 m^2

11) Calculate the mass (in lbs) of a sample of ethanol that has a 2.5 qt volume?

A) 4.1 lb B) 5.0 lb C) 6.6 lb

D) 0.95 lb E) 2.7 lb F) 13 lb

12) At which of these temperatures would the molecules in a sample of water be moving the fastest?

A) 55 K B) 55°C C) 55°F

D) 105 K E) 105°C F) 105°F

13) Which of the following statements is false?
   A) A substance's temperature is related to the motion of its atoms
   B) The joule (J) is the SI unit of energy
   C) A temperature change of one Kelvin is the same as one degree Celsius.
   D) Freezing ice is an exothremic process
   E) The products of a chemical reaction are always lower in energy than the reactants
   F) Absolute zero (defined as 0 K) is the coldest possible temperature

14) According to what was said in lecture, which of the following statements most closely matches the way a chemist talks about the potential energy of a baseball?
   A) The energy due to the location of the whole baseball
   B) The energy due to the motion of the atoms and molecules making up the baseball
   C) The energy that it took to make the baseball
   D) The energy trapped in the chemical bonds within the baseball
   E) The energy due to the speed of the whole baseball
   F) None of these statements

15) A bag of Cheetos has 170. Calories. If bowling burns 1.03×10^6 J/hour, how many minutes will you need to bowl to burn off 1 bag of Cheetos?

A) 41.4 min	B) 82.3 min	C) 124 min
D) 0.691 min	E) 0.124 min	F) 4.14×10^{13} min

16) If adding 62.0 calories to an aluminum block causes the temperature of the aluminum to increase from 62°F to 89°F, what is the mass (in g) of the aluminum block?

A) 98 g	B) 19 g	C) 11 g
D) 4.6 g	E) 0.39 g	F) 2.5 g

17) Brass is an alloy made from mixing copper and zinc. Assuming the density of brass varies linearly with the % of copper present, calculate the mass (in g) of a sample of brass that is 58.0% copper and has a volume of 0.336 in^3.

A) 2.75 g B) 44.2 g C) 2.65 g
D) 45.0 g E) 43.4 g F) 6.97 g

18) A 30.0 g sample of copper is heated to 245.0°C and dropped into 150.0 g of water at 35.0°C. What is the final temperature of the copper and the water? Report your final answer with 3 sig figs.

A) 31.1°C B) 5.06°C C) -3.94°C
D) 140.°C E) 38.8°C F) 14.6°C

19) How many μg are in 6.0×10^{-5} Mg?

A) 6.0×10^{-7} μg B) 6.0×10^{5} μg C) 6.0×10^{7} μg
D) 6.0×10^{-5} μg E) 6.0×10^{9} μg F) 6.0×10^{12} μg

20) A hybrid car averages 62 miles/gallon. How many L of gas will it take for this hybrid car to drive 45 km?

A) 4.4 L B) 1.7 L C) 1.2×10^{3} L
D) 0.24 L E) 2.8 L F) 9.8×10^{2} L

Answer key: each question is worth 5 pts

1) C	2) F	3) E	4) B	5) B
6) E	7) B	8) B	9) D	10) F
11) A	12) E	13) E	14) D	15) A
16) B	17) D	18) E	19) C	20) 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 and 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.]