Chemistry 050 Information Sheet

1. Chemistry 050 is the prerequisite for Chemistry 111.

2. If you are planning to take Chemistry 111 but don't want to take Chemistry 050 then it is recommended that you received a grade of B or better in a high school chemistry course AND you must have received:

   a. a score of 60% or better on the chemistry placement exam, OR

   b. a minimum 560 math SAT or minimum 25 math ACT score, OR

   c. a grade of C or better in Math 143, Math 160, or Math 170, OR

   d. a grade of C or better in Chemistry 101, OR

   e. a score of 49 or better on the COMPASS College Algebra exam.

3. A practice chemistry placement exam is given below. The chemistry placement exam is designed to test your knowledge of basic chemistry. Topics covered on the exam are: significant figures, the metric system, dimensional analysis (unit conversion), density, nomenclature of simple inorganic compounds and common acids, percent mass calculations, scientific notation, balancing equations, molar mass (molecular weight), the mole, stoichiometry, molarity, dilutions, basic algebra, and graphing. You should have had most of these topics in your high school chemistry course.

Be sure to bring a bring a non-text entry/non-graphing scientific calculator, #2 pencil and photo ID when you come to take the test.

**Practice Chemistry Placement Exam**

1. In order to pass this exam you must get a score of at least 60% (15 or more of the 25 questions correct).
2. Do all of your work on this exam. No scratch paper.
3. Text-entry/graphing calculators may not be used during the exam.
4. You may not remove the exam or any other related materials from the test site.
5. A **PICTURE ID** is required in order to take the exam. Please show it to the proctor when you turn in the exam.
6. Students enrolled in Chem 050 are not eligible to take the placement exam when it is offered during preregistration advising for the next semester.
7. The placement exam can be taken more than one time (it will change each time it is given) however you must wait **A MINIMUM** of two months before attempting to take the exam again and it may be repeated only during the scheduled times.

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**GENERAL INFORMATION:** Avogadro's number: $6.02 \times 10^{23}$ ; 2.54 cm = 1 in ; 454 g = 1 lb

946 mL = 1 qt ; 5280 ft = 1 mile ; 16 oz = 1 lb ; 2 pt = 1 qt ; 4 qt = 1 gal

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## PERIODIC TABLE OF THE ELEMENTS

| 1A | 2A | 3B | 4B | 5B | 6B | 7B | 8B | 8B | 8B | 1B | 2B | 3A | 4A | 5A | 6A | 7A | 8A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 **H** 1.01 | | | | | | | | | | | | | | | | | 2 **He** 4.00 |
| 3 **Li** 6.94 | 4 **Be** 9.01 | | | | | | | | | | | 5 **B** 10.81 | 6 **C** 12.01 | 7 **N** 14.01 | 8 **O** 16.00 | 9 **F** 19.00 | 10 **Ne** 20.18 |
| 11 **Na** 22.99 | 12 **Mg** 24.31 | | | | | | | | | | | 13 **Al** 26.98 | 14 **Si** 28.09 | 15 **P** 30.97 | 16 **S** 32.07 | 17 **Cl** 35.45 | 18 **Ar** 39.95 |
| 19 **K** 39.10 | 20 **Ca** 40.08 | 21 **Sc** 44.96 | 22 **Ti** 47.88 | 23 **V** 50.94 | 24 **Cr** 52.00 | 25 **Mn** 54.94 | 26 **Fe** 55.85 | 27 **Co** 58.93 | 28 **Ni** 58.69 | 29 **Cu** 63.55 | 30 **Zn** 65.39 | 31 **Ga** 69.72 | 32 **Ge** 72.61 | 33 **As** 74.92 | 34 **Se** 78.96 | 35 **Br** 79.90 | 36 **Kr** 83.80 |
| 37 **Rb** 85.47 | 38 **Sr** 87.62 | 39 **Y** 88.91 | 40 **Zr** 91.22 | 41 **Nb** 92.91 | 42 **Mo** 95.94 | 43 **Tc** (98) | 44 **Ru** 101.07 | 45 **Rh** 102.91 | 46 **Pd** 106.42 | 47 **Ag** 107.87 | 48 **Cd** 112.41 | 49 **In** 114.82 | 50 **Sn** 118.71 | 51 **Sb** 121.76 | 52 **Te** 127.60 | 53 **I** 126.90 | 54 **Xe** 131.3 |
| 55 **Cs** 132.91 | 56 **Ba** 137.33 | 57 **La** 138.91 | 72 **Hf** 178.49 | 73 **Ta** 180.95 | 74 **W** 183.85 | 75 **Re** 186.21 | 76 **Os** 190.2 | 77 **Ir** 192.22 | 78 **Pt** 195.08 | 79 **Au** 196.97 | 80 **Hg** 200.59 | 81 **Tl** 204.38 | 82 **Pb** 207.19 | 83 **Bi** 208.98 | 84 **Po** (209) | 85 **At** (210) | 86 **Rn** (222) |
| 87 **Fr** (223) | 88 **Ra** 226.03 | 89 **Ac** (227) | 104 **Rf** (261) | 105 **Db** (262) | 106 **Sg** (263) | 107 **Bh** (264) | 108 **Hs** (265) | 109 **Mt** (268) | | | | | | | | | |

**PRACTICE CHEMISTRY PLACEMENT EXAM**

1. How many of the numbers below have 5 significant figures?

0.0054 19.000 0.00006 $1.6090 \times 10^8$ 13607

a) 1
b) 2
c) 3
d) 4
e) 5

2. Nitric acid is a solution of which of the following dissolved in water?

a) $HNO_4$
b) $H_2NO_3$
c) $HNO_2$
d) $HNO_3$
e) $H_2NO$

3. Which of the following is the smallest mass?

a) 2.1 kg
b) $4.2 \times 10^{10}$ ng
c) $5.8 \times 10^2$ g
d) $8.4 \times 10^4$ cg
e) $6.7 \times 10^4$ mg

4. If 250 mL of a 0.50 M NaCl solution is diluted to 840 mL, what is the molarity of the resulting solution?

a) 0.15 M
b) 6.7 M
c) 0.60 M
d) 1.7 M
e) 0.0025 M

5. Iron(III) sulfite has the formula

a) $Fe_3SO_3$
b) $Fe_2(SO_4)_3$
c) $Fe_2(SO_3)_3$
d) $Fe_2SO_4$
e) $Fe_2SO_3$

6. How many atoms of carbon are in 24 grams of carbon?

a) $1.2 \times 10^{24}$ atoms
b) $1.7 \times 10^{26}$ atoms
c) $1.2 \times 10^{25}$ atoms
d) $3.0 \times 10^{24}$ atoms
e) $3.0 \times 10^{23}$ atoms

7. A solution is prepared by dissolving sugar in water. The solution is 25.0%, by mass, sugar. How many grams of **WATER** are in 472 grams of this solution?

   a) 118 g
   b) 157 g
   c) 408 g
   d) 354 g
   e) 396 g

8. The balanced chemical equation for the reaction between $PCl_5$ and water is given below. If 3.45 moles of HCl are produced, how many moles of water reacted?

$$PCl_5 + 4\,H_2O \rightarrow H_3PO_4 + 5\,HCl$$

   a) 0.690 mol
   b) 0.863 mol
   c) 2.76 mol
   d) 3.45 mol
   e) 4.31 mol

9. How many grams of calcium bromide are in 50.0 mL of a 0.25 M calcium bromide solution?

   a) 2.5 g
   b) 1.5 g
   c) $1.3 \times 10^{-2}$ g
   d) 24 g
   e) 40. g

10. 26.0 g of a liquid that has a density of 1.44 g/mL needs to be measured out in a graduated cylinder. What volume should be used?

   a) 37.4 mL
   b) 0.0554 mL
   c) 18.1 mL
   d) 0.0267 mL
   e) 26.0 mL

11. One gram of alum, $KAl(SO_4)_2 \cdot 12H_2O$, contains $1.3 \times 10^{21}$ Al atoms. How many oxygen atoms are contained in 1.0 g alum?

   a) $1.3 \times 10^{21}$ atoms
   b) $2.6 \times 10^{22}$ atoms
   c) $1.6 \times 10^{22}$ atoms
   d) $1.0 \times 10^{22}$ atoms
   e) $2.1 \times 10^{22}$ atoms

12. How many grams of $AlF_3$ are in 2.64 moles of $AlF_3$?

   a) $3.14 \times 10^{-2}$ g
   b) 121 g
   c) 222 g
   d) $5.74 \times 10^{-2}$ g
   e) 31.8 g

13. The balanced chemical equation for the reaction between $PCl_5$ and water is given below. If 12.0 g of $PCl_5$ reacts completely with water, how many grams of HCl will be produced?

$$PCl_5 + 4\ H_2O \rightarrow H_3PO_4 + 5\ HCl$$

a) 60.0 g
b) 2.10 g
c) 0.420 g
d) 0.0952 g
e) 10.5 g

14. Which of the following would be the correct name for $N_2O_3$?

a) dinitrogen trioxide
b) nitrogen(II) oxide
c) nitrogen(III) oxide
d) nitrogen oxide
e) nitrogen(II) oxygen(III)

15. How many moles of $C_4F_8$ are in 265 grams of $C_4F_8$?

a) 8.55 mol
b) $1.89 \times 10^{-5}$ mol
c) $5.30 \times 10^{4}$ mol
d) 1.32 mol
e) 0.755 mol

16. What is the percent, by mass, of oxygen in $Zn(BrO_3)_2$?

a) 24.83%
b) 39.00%
c) 29.89%
d) 39.79%
e) 17.57%

17. Given: Z = 0.43Y + 12 ; What is Y when Z = 28 ?

a) 93
b) 6.9
c) 24
d) 17
e) 37

18. A metal having a mass of 44 grams is dropped in 118.2 $cm^3$ of water and sinks to the bottom. The volume of the water and object is 124.3 $cm^3$. What is the density of the metal?

a) 0.37 $g/cm^3$
b) 7.2 $g/cm^3$
c) 0.35 $g/cm^3$
d) 2.7 $g/cm^3$
e) 2.9 $g/cm^3$

19. When the equation below is properly balanced, what is the coefficient for $S_8$?

$$Cr + S_8 \rightarrow Cr_2S_3$$

a) 1
b) 2
c) 3
d) 4
e) none of these

20. An antacid tablet containing 0.50 g of $NaHCO_3$ is dissolved in 250 mL of water. What is the molar concentration of $NaHCO_3$ in the solution?

a) 0.024 M
b) 4.1 M
c) 0.0020 M
d) 0.0060 M
e) 2.0 M

21. What is the formula of the compound formed between the potassium ion and the sulfide ion?

a) KS
b) $KS_2$
c) $K_2S_3$
d) $KS_3$
e) $K_2S$

22. How many mL of 0.250 M $H_2SO_4$ is required to completely react with 25.0 mL of 1.50 M NaOH?

$$H_2SO_4 + 2\ NaOH \rightarrow Na_2SO_4 + 2\ H_2O$$

a) 150. mL
b) 50.0 mL
c) 300. mL
d) 75.0 mL
e) none of the above

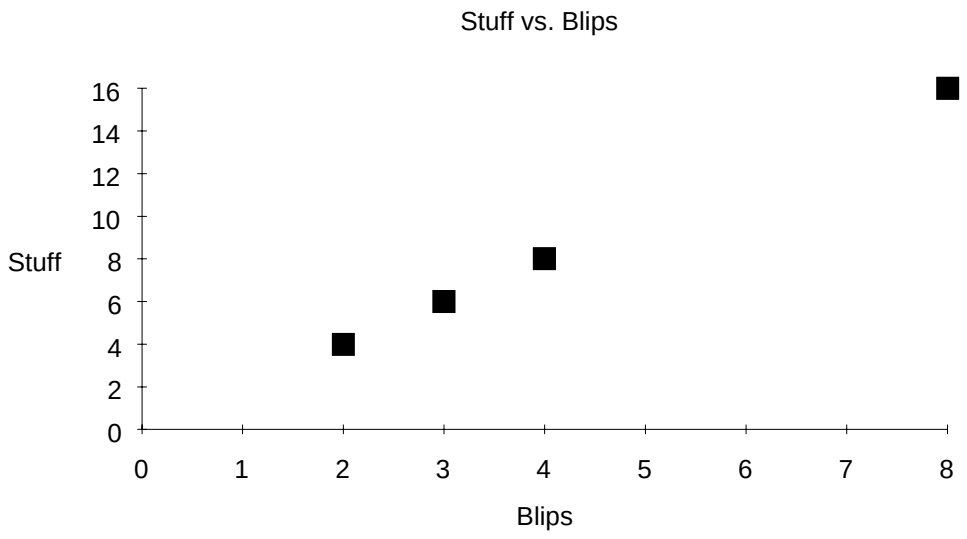
23. Assume that you are a physician administering a drug in a solution containing 5.0 mg drug/L solution. If the recommended dosage of the drug is $3.5 \times 10^{-6}$ g per kilogram of body weight, what volume of solution would you prescribe daily for a 68 kg patient?

a) 97 mL
b) 53 mL
c) 86 mL
d) 23 mL
e) 48 mL

24. How many kilometers is $5.82 \times 10^4$ cm?

a) $5.82 \times 10^3$ km
b) 0.582 km
c) $5.82 \times 10^9$ km
d) 5.82 km
e) $5.82 \times 10^5$ km

25. Data was collected on an experiment that relates "Stuff" to "Blips". Using a "best fit" line for the data, how much stuff would I have if I had 20 blips?




a) 0 b) 10 c) 20 d) 30 e) 40

Answers:

1. c
2. d
3. b
4. a
5. c
6. a
7. d
8. c
9. a
10. c
11. b
12. c
13. e
14. a
15. d
16. c
17. e
18. b
19. c
20. a
21. e
22. d
23. e
24. b
25. e