

CHEMISTRY 101 Practice Exam 1 DR. PECK

- Directions: (1) Choose the best answer for each multiple choice question (numbers 1 - 15). Transfer your multiple choice answers onto the scantron.
- (2) Do not separate any of the pages. When finished, give the proctor at the front of the room both the exam and the completed scantron. Cover your exam and your work whenever possible.

NAME _____

_____ (print)

_____ (signature)

_____ (seat no.)

(NOTE: This practice exam does not contain questions based upon topics from Chapter 5. The actual exam may or may not depending upon our ability to cover Chapter 5 in lecture before the date of the first exam.)

- Which one of the following is a weak acid?
 (a) HBr (b) HClO₄ (c) HNO₃ (d) HCl (e) HClO₂
- What is the oxidizing agent in the following reaction?

$$6\text{KOH}(\text{aq}) + 3\text{Cl}_2(\text{g}) \rightarrow \text{KClO}_3(\text{aq}) + 5\text{KCl}(\text{aq}) + 3\text{H}_2\text{O}(\text{l})$$
 (a) KOH (b) KCl (c) KClO₃ (d) Cl₂ (e) H₂O
- Balance the following equation with the **smallest whole number coefficients**. What is the coefficient for HCl in the balanced equation?

$$\text{SnS}_2 + \text{HCl} \rightarrow \text{H}_2\text{SnCl}_6 + \text{H}_2\text{S}$$
 (a) 4 (b) 6 (c) 3 (d) 12 (e) 2
- Classify the following reaction by giving **all** of these reaction type(s) that apply.
 I. redox II. combination III. decomposition
 IV. displacement V. metathesis

$$2\text{PbO}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{PbO}_2(\text{s})$$
 (a) I and V (b) only II (c) I and II (d) only III (e) only V

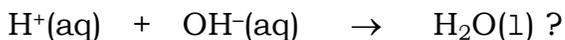
5. Each response below lists an ion by name and by chemical symbol or formula. Also each ion is classified as monatomic or polyatomic and as a cation or anion. Which response contains an **error**?

(a)	phosphate	PO_4^{3-}	polyatomic	anion
(b)	sulfite	SO_3^{2-}	polyatomic	anion
(c)	nitrite	NO_3^-	polyatomic	anion
(d)	iron(II)	Fe^{2+}	monatomic	cation
(e)	bromide	Br^-	monatomic	anion

6. Which of the following matched pairs of name and formula has an error?

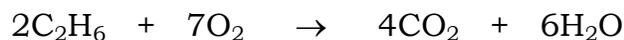
	<u>Formula</u>	<u>Name</u>
(a)	N_2O_4	dinitrogen oxide
(b)	I_2O_7	diiodine heptoxide
(c)	As_2O_5	diarsenic pentoxide
(d)	P_4O_{10}	tetraphosphorus decoxide
(e)	S_4N_4	tetrasulfur tetranitride

7. Which of the following equations could **not** be a formula unit equation for the net ionic equation:



- (a) $\text{HCN}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{NaCN}(\text{aq}) + \text{H}_2\text{O}(\text{l})$
 (b) $\text{HNO}_3(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{NaNO}_3(\text{aq}) + \text{H}_2\text{O}(\text{l})$
 (c) $\text{HCl}(\text{aq}) + \text{KOH}(\text{aq}) \rightarrow \text{KCl}(\text{aq}) + \text{H}_2\text{O}(\text{l})$
 (d) $\text{HClO}_4(\text{aq}) + \text{LiOH}(\text{aq}) \rightarrow \text{LiClO}_4(\text{aq}) + \text{H}_2\text{O}(\text{l})$
 (e) $\text{Ba}(\text{OH})_2(\text{aq}) + 2\text{HCl}(\text{aq}) \rightarrow \text{BaCl}_2(\text{aq}) + 2\text{H}_2\text{O}(\text{l})$

8. How many moles of CO_2 would be produced from 56 moles of O_2 according to the following balanced equation?



- (a) 8 (b) 16 (c) 32 (d) 48 (e) 224

9. Calculate the number of atoms in 40.5 g of aluminum.

- (a) 900 (b) 2.5×10^{-24} (c) 1.8×10^{-21}
 (d) 6.6×10^{26} (e) 9.0×10^{23}

10. A compound contains sulfur, oxygen, and chlorine. Analysis shows that it contains by mass 26.95% sulfur and 59.61% chlorine. What is the simplest formula for this compound?
- (a) SOCl (b) SO₂Cl₂ (c) SOCl₂ (d) SO₂Cl (e) S₂OCl₂
11. The specific gravity of ethyl chloride, an external painkiller, is 1.37 at 10°C. What is the mass of 47.4 mL of the liquid?
- (a) 0.346 g (b) 34.6 g (c) 52.5 g (d) 56.6 g (e) 64.9 g
12. What mass of SrF₂ can be prepared from the reaction of 8.05 g of Sr(OH)₂ with 3.88 g of HF?
- $$\text{Sr(OH)}_2 + 2\text{HF} \rightarrow \text{SrF}_2 + 2\text{H}_2\text{O}$$
- (a) 8.31 g (b) 8.62 g (c) 10.5 g (d) 11.7 g (e) 12.2 g
13. The reaction of 5.0 g of fluorine with excess chlorine produced 7.0 g of ClF₃. What percent yield of ClF₃ was obtained?
- $$\text{Cl}_2 + 3\text{F}_2 \rightarrow 2\text{ClF}_3$$
- (a) 58% (b) 69% (c) 76% (d) 86% (e) 92%
14. What is the molarity of 910. mL of a solution containing 46.2 grams of NaBr?
- (a) 0.493 *M* (b) 0.506 *M* (c) 0.516 *M* (d) 0.528 *M*
(e) 0.545 *M*

15. If a reaction of 5.0 g of hydrogen with 5.0 g of carbon monoxide produced 5.5 g of methanol, what was the percent yield?



- (a) 11% (b) 24% (c) 63% (d) 79% (e) 96%
16. A sample of commercial perchloric acid is 70.0% HClO_4 by mass; its density is 1.664 g/mL. How many milliliters of this concentrated HClO_4 would be required to prepare 500. mL of 1.25 M HClO_4 solution? Show your work.
Ans. _____
17. What volume of 4.00 molar sulfuric acid, H_2SO_4 , is required to react with 250. grams of calcium carbonate, CaCO_3 ? Show your work.



Ans. _____

Answers: 1.(E), 2(D), 3(B), 4(C), 5(C), 6(A), 7(A), 8(C), 9(E), 10(C), 11(E), 12(A), 13(D), 14(A), 15(E), 16(53.9 mL), 17(625 mL)