

Exam 1

Multiple Choice

Identify the choice that best completes the statement or answers the question.

Record your name on the top of this exam and on the scantron form.

Record the test ID letter in the top right box of the scantron form.

Record all of your answers on the scantron form.

1. An electrically charged atom or group of atoms is a(n)
 - a. element.
 - b. ion.
 - c. chemical compound.
 - d. heterogeneous mixture.
 - e. homogeneous mixture.

2. What is the balanced chemical equation for the complete combustion of methanol, CH₃OH?
 - a. $\text{CH}_3\text{OH}(\ell) \rightarrow \text{CO}(\text{g}) + 2 \text{H}_2(\text{g})$
 - b. $\text{CH}_3\text{OH}(\ell) \rightarrow \text{CH}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$
 - c. $\text{CH}_3\text{OH}(\ell) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$
 - d. $2 \text{CH}_3\text{OH}(\ell) + 3 \text{O}_2(\text{g}) \rightarrow 2 \text{CO}_2(\text{g}) + 4 \text{H}_2\text{O}(\text{g})$
 - e. $2 \text{CH}_3\text{OH}(\ell) + 4 \text{O}_2(\text{g}) \rightarrow 2 \text{CO}_2(\text{g}) + 4 \text{H}_2\text{O}(\text{g})$

first carbon → 2 on each side
then hydrogen → 8 on each side
then oxygen → 8 on each side

3. What is the **net ionic equation** for the reaction of aqueous perchloric acid and aqueous potassium hydroxide?
 - a. $\text{HClO}_4(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\ell) + \text{ClO}_4^-(\text{aq})$
 - b. $\text{ClO}_4^-(\text{aq}) + \text{K}^+(\text{aq}) \rightarrow \text{KClO}_4(\text{s})$
 - c. $\text{HClO}_4(\text{aq}) + \text{KOH}(\text{aq}) \rightarrow \text{KClO}_4(\text{aq}) + \text{H}_2\text{O}(\ell)$
 - d. $\text{ClO}_4^-(\text{aq}) + \text{K}^+(\text{aq}) \rightarrow \text{KClO}_4(\text{aq})$
 - e. $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\ell)$

strong acid + strong base

4. What halogen is in the second period?
 - a. N
 - b. O
 - c. F ← the only halogen
 - d. Ne
 - e. Ar

5. The formula for acetic acid, CH₃CO₂H, is an example of a(n)
 - a. condensed formula.
 - b. empirical formula.
 - c. structural formula.
 - d. ionic compound formula.
 - e. mass spectrum.

Name: _____

ID: E

6. Which of the following formulas is not correct?
- a. $\text{Al}_3(\text{CO}_3)_2$ $\text{Al}^{3+} \times 3 = 9+$
b. KClO_4
c. BaO
d. $\text{Ca}(\text{NO}_3)_2$
e. Na_2HPO_4 $\text{CO}_3^{2-} \times 2 = 4-$
charge is not balanced
7. Which one of the following is most likely to be a **homogeneous** mixture?
- a. blood
b. ground beef
c. the air trapped inside an inflated balloon
d. chocolate chip cookies
e. mortar (a mixture of calcium carbonate and sand)
8. Which of the following compounds is a weak acid?
- a. HCl
b. $\text{CH}_3\text{CO}_2\text{H}$
c. HNO_3
d. HClO_4
e. H_2SO_4
9. Which one of the following substances is classified as an element?
- a. P_4
b. NO only made of 1 type of atom
c. KCl
d. $\text{C}_6\text{H}_{12}\text{O}_6$
e. NO_2
10. What is the correct name for N_2O_3 ?
- a. nitrogen oxide
b. oxygen nitride
c. dinitrogen trioxide
d. nitrogen trioxide
e. trioxygen dinitride
11. An element consists of two isotopes. The abundance of one isotope is 60.1% and its atomic mass is 68.9256 u. The atomic mass of the second isotope is 70.9247 u. What is the average atomic mass of the element?
- a. 69.7 u
b. 69.9 u
c. 70.1 u
d. 84.1 u
e. 139.9 u
- $68.9256(0.601) + 70.9247(1 - 0.601) = 69.723$

