

# Chemistry 10 Practice Guide

**This guide is designed to help students prepare for the Chemistry 10 placement test if they wish to enter Chemistry 20 without having Science 10 on their transcripts. Answers are the end of this document.**

**A grade of 70% on the test is considered a pass and will allow entry into Chemistry 20 (181) provided that other admission requirements (e.g. for the daytime program) have been met. The test cannot be used for admission into any SAIT program and is for Academic Upgrading placement purposes only.**

**For a periodic table and a solubility table, please use Alberta Education's version at <http://education.alberta.ca/admin/testing/diplomaexams.aspx> (click on the Chemistry 30 data booklet link). Note that you will require the periodic table pages and the solubility table only; the other pages in the data booklet are not required and are not provided on the exam. Both of these will be provided to you during the exam.**



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## Section I. Multiple Choice

Choose the one best answer.

1. John Dalton proposed four ideas in his model of the atom. Which of the following is **not** part of his model?
  - a) all matter is made of small indivisible particles
  - b) atoms of different elements have different properties
  - c) atoms are never created or destroyed during a chemical reaction
  - d) all the atoms of an element are identical in properties such as size and mass
2. A certain chemical family is composed of elements that are soft, shiny, very reactive with water, and form ions with a charge of 1+. This family could be
  - a) the halogens
  - b) the noble gases
  - c) the alkali metals
  - d) the alkaline-earth metals
3. Which column in the periodic table contains elements with one electron in their valence energy level?
  - a) first on the left
  - b) first on the right
  - c) second from the left
  - d) second from the right
4. Which two particles are approximately equal in mass?
  - a) proton and neutron
  - b) proton and electron
  - c) neutron and electron
  - d) none of these
5. The magnesium ion,  $\text{Mg}^{+2}$ , has
  - a) 10 electrons and 10 protons
  - b) 10 electrons and 12 protons
  - c) 12 electrons and 10 protons
  - d) 12 electrons and 12 protons
6. An atom of fluorine has 9 protons, 10 neutrons, and 9 electrons. Its mass number is
  - a) 9
  - b) 10
  - c) 18
  - d) 19
7. What is the formula for sodium carbonate?
  - a)  $\text{S}_2\text{CO}_{3(s)}$
  - b)  $\text{NaCO}_{(s)}$
  - c)  $\text{Na}_2\text{CO}_{3(s)}$
  - d)  $\text{Na}_3\text{CO}_{3(s)}$

8. What is the formula for aluminium hydroxide?

- a)  $\text{AlOH}_{3(s)}$
- b)  $\text{Al}_3\text{OH}_{(s)}$
- c)  $\text{Al}(\text{OH})_{3(s)}$
- d)  $\text{Al}(\text{III})\text{OH}_{(s)}$

9. Which of the following is an ionic compound?

- a)  $\text{HCl}_{(aq)}$
- b)  $\text{KCl}_{(s)}$
- c)  $\text{ClO}_{3(g)}$
- d)  $\text{NCl}_{3(g)}$

10. Which of the following properties are characteristic of an ionic compound?

- I It is malleable.
- II It is solid at room temperature.
- III Its solution conducts electricity.

- a) I and II only
- b) I and III only
- c) II and III only
- d) I, II, and III

11. Which of the following are very soluble?

- I  $\text{Na}_2\text{S}$
- II  $\text{CuBr}$
- III  $\text{Sr}(\text{OH})_2$

- a) I and II only
- b) I and III only
- c) II and III only
- d) I, II, and III

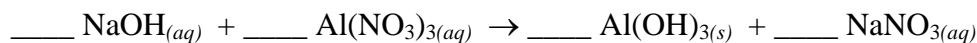
12. Which of the following is a general property of bases?

- a) taste sour
- b) turn litmus red
- c) conduct electricity
- d) react with Mg to produce hydrogen bubbles

13. Which of the following is an acid?

- a)  $\text{CH}_4(g)$
- b)  $\text{K}_3\text{PO}_4(aq)$
- c)  $\text{H}_3\text{PO}_4(aq)$
- d)  $\text{NaOH}(aq)$

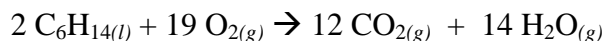
14. Consider the following reaction:



The coefficient for  $\text{Al}(\text{NO}_3)_3$  when the above equation is balanced is

- a) 1
- b) 2
- c) 3
- d) 4

15. The following reaction takes place when gasoline reacts with air:



*(insert earth-shattering kaboom! noise here.)*

This reaction is

- a) single replacement reaction
- b) double replacement reaction
- c) hydrocarbon combustion reaction
- d) decomposition reaction

## Section II. Skills

Name or give the formula for each compound in questions 24 to 33. (1 mark each)

16.  $\text{CaBr}_{2(s)}$  \_\_\_\_\_

17.  $\text{Au}_3\text{PO}_{4(s)}$  \_\_\_\_\_

18.  $\text{N}_2\text{O}_{4(g)}$  \_\_\_\_\_

19.  $\text{NH}_{3(s)}$  \_\_\_\_\_

20.  $\text{H}_2\text{SO}_{4(aq)}$  \_\_\_\_\_

21. lead(IV) sulfide \_\_\_\_\_

22. methane \_\_\_\_\_

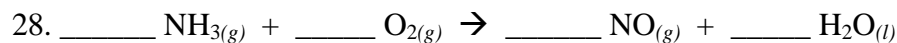
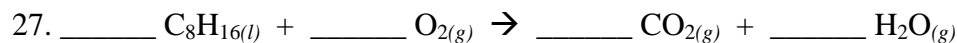
23. sulfur trioxide \_\_\_\_\_

24. hydrochloric acid \_\_\_\_\_

25. iron(II) nitride \_\_\_\_\_

## Section III. Written Response

Balance the equations in questions 31, 32, and 33.



Predict the formulas of the products for each reaction below and WRITE them in the spaces provided, but do NOT balance the equations. Also, state the FULL name of the reaction type for each reaction.

	Products	Reaction Type
29. $\text{Na}_{(s)} + \text{Br}_{2(l)} \rightarrow$	_____	_____
30. $\text{CH}_{4(g)} + \text{O}_{2(g)} \rightarrow$	_____	_____
31. $\text{Al}_{(s)} + \text{CuCl}_{2(aq)} \rightarrow$	_____	_____
32. $\text{NaI}_{(aq)} + \text{Pb}(\text{NO}_3)_{2(aq)} \rightarrow$	_____	_____

Write balanced formula equations for the reactions in questions 33 and 34.

33. Aqueous ammonium sulfide and aqueous lead(II) nitrate are mixed together. They react to yield aqueous ammonium nitrate and solid lead(II) sulfide.

34. Copper metal is placed in a solution of silver nitrate. This produces aqueous copper(II) nitrate and silver metal.

35. The element nitrogen has two common isotopes: nitrogen-14 and nitrogen-16.

a) State how these two types of atoms are similar.

\_\_\_\_\_

b) State how these two types of atoms are different.

\_\_\_\_\_

## Chemistry Answers

### Section I. Multiple Choice

1. c
2. c
3. a
4. a
5. b
6. d
7. c
8. c
9. b
10. c
11. b
12. c
13. c
14. a
15. c

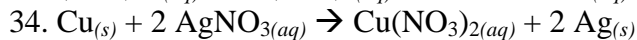
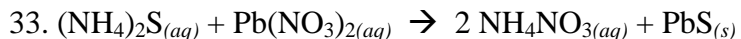
### Section II. Skills

16. calcium bromide
17. gold(III) phosphate
18. dinitrogen tetroxide
19. ammonia
20. sulfuric acid
21.  $\text{PbS}_{2(s)}$
22.  $\text{CH}_{4(g)}$
23.  $\text{SO}_{3(g)}$
24.  $\text{HCl}_{(aq)}$
25.  $\text{Fe}_3\text{N}_{2(s)}$

### Section III. Response

26. 4, 1, 2
27. 1, 12, 8, 8
28. 4, 5, 4, 6

29.  $\text{NaBr}_{(s)}$  formation
30.  $\text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}$  hydrocarbon combustion
31.  $\text{AlCl}_{3(aq)} + \text{Cu}_{(s)}$  single replacement
32.  $\text{NaNO}_{3(aq)} + \text{PbI}_{2(s)}$  double replacement



35. a) Both atoms have the same number of protons or atomic number.  
b) One has 7 neutrons and the other has 8 neutrons. Their mass numbers are different.