

**CHM 1025 Practice Questions – Chapters 2, 3, 4 & 5**

1. A piece of silver (Ag) metal weighing 194.3 g is placed in a graduated cylinder containing 242.0 mL of water. The volume of water now reads 260.5 mL. From these data calculate the density of silver.
2. The density of lithium metal is  $535 \text{ kg/m}^3$ . What is this density in  $\text{g/cm}^3$ ?
  - a.  $0.000535 \text{ g/cm}^3$
  - b.  $0.535 \text{ g/cm}^3$
  - c.  $0.0535 \text{ g/cm}^3$
  - d.  $0.54 \text{ g/cm}^3$
  - e.  $53.5 \text{ g/cm}^3$
3. A sample of water is heated from room temperature to just below the boiling point. The overall change in temperature is 72 degrees Celsius. Express this temperature change in Kelvins.
  - a. 345 K
  - b. 72 K
  - c. 0 K
  - d. 201 K
  - e. 273 K
4. How many neutrons does  $^{235}_{92}\text{U}$  contain?
  - a. 235
  - b. 92
  - c. 238
  - d. 143
  - e. 327
5. What is the mass number of an oxygen atom with nine neutrons in its nucleus?
  - a. 8
  - b. 9
  - c. 17
  - d. 16
  - e. 18
6. What is the correct formula for sodium nitride?
  - a. NaN
  - b.  $\text{NaN}_3$
  - c.  $\text{Na}_3\text{N}$
  - d.  $\text{NaNO}_3$
  - e.  $\text{NaNO}_2$
7. What is the correct name of the compound  $\text{Hg}_2\text{CrO}_4$ ?
  - a. Mercury(I) chromate
  - b. Mercury(II) chromate
  - c. Mercury dichromate
  - d. Dimercury chromate
  - e. Monomercury chromate

8. A monatomic ion has a charge of +2. The nucleus of the parent atom has a mass number of 55. If the number of neutrons in the nucleus is 1.2 times that of the number of protons, what is the name and symbol of the element?
9. What is the correct name of the compound  $\text{HClO}_4$ ?
- Chlorite
  - Chloric Acid
  - Perchloric Acid
  - Hydrochloric Acid
  - Chlorate
10. A fictional element with atomic mass 30.0584 amu has two naturally occurring isotopes with their abundances shown here. Find the mass of isotope 29.

| Isotope | Abundance | Mass (amu) |
|---------|-----------|------------|
| 30      | 30%       | 30.0964    |
| 29      |           |            |

- 29.5485 amu
  - 29.8261 amu
  - 30.0421 amu
  - 30.0962 amu
  - 30.1025 amu
11. How much energy is required to heat 8 grams of water from 9 degrees Celsius to 56 degrees Celsius?
- 366 J
  - 1573 J
  - 1929 J
  - 87 J
  - 2031 J
12. How much energy is required to heat 8 grams of water from 9 degrees Celsius to 56 degrees Celsius ?
- 366 J
  - 1573 J
  - 1929 J
  - 87 J
  - 2031 J
13. To which of the following does  $\text{C}_6\text{H}_{12}\text{O}_6$  (glucose) correspond?
- formula mass: 180.16 amu
  - molecular mass: 180.16 amu
  - formula mass: 30.03 amu
  - molecular mass: 30.03 amu
14. Who is credited with the discovery the electron? How was the electron discovered?

- a. Ernest Rutherford; Gold-Foil Experiment
  - b. J. J. Thomson; Gold-Foil Experiment
  - c. John Dalton; Cathode Rays
  - d. Robert Millikan; Oil-Drop Experiment
  - e. J. J. Thomson; Cathode Rays
15. Match the elements with their respective groups.
- |                          |              |
|--------------------------|--------------|
| a. Alkali metals         | 1) Potassium |
| b. Alkaline earth metals | 2) Argon     |
| c. Halogens              | 3) Bromine   |
| d. Noble gases           | 4) Barium    |
16. Which element does NOT naturally exist as a diatomic molecule?
- |             |             |
|-------------|-------------|
| a. Iodine   | e) Bromine  |
| b. Chlorine | f) Nitrogen |
| c. Hydrogen | g) Carbon   |
| d. Oxygen   | h) Fluorine |
17. Provide response in scientific notation. Consider significant figures.
- a.  $(8.346 \times 10^8) + (9.17 \times 10^6)$
  - b.  $(3.5291 \times 10^7) - (1.8 \times 10^6)$
  - c.  $(3.5291 \times 10^5) \div (1.8 \times 10^3)$
  - d.  $(3.5291 \times 10^9) \times (1.8 \times 10^2)$
18. Match the following:
- |                          |                         |
|--------------------------|-------------------------|
| a. Solution              | 1) Argon                |
| b. Heterogeneous Mixture | 2) NaCl                 |
| c. Compound              | 3) Salt water           |
| d. Element               | 4) balsamic vinaigrette |
19. Order the prefixes in increasing order.
- |       |          |
|-------|----------|
| a. p  | e) m     |
| b. h  | f) G     |
| c. k  | g) d     |
| d. da | h) $\mu$ |
20. How much of product B was produced? Reflect your answer in scientific notation.
- $8.3 \times 10^4 \text{g AB} \rightarrow 5.6 \times 10^3 \text{g A} + \text{_____g B}$

**Answer key**

1. 10.5 g/mL

2. b

3. a

4. d

5. c

6. c

7. a

8.  $^{55}_{25}\text{Mn}^{2+}$ ; manganese

9. c

10. c

11. b

12. b

13. b

14. e

15.

a—1

b—4

c—3

d—2

16. g

17.

a.  $8.438 \times 10^8$

b.  $3.35 \times 10^7$

c.  $2.0 \times 10^2$

d.  $6.4 \times 10^{11}$

18.

a—3

b—4

c—2

d—1

19. a, h, e, g, d, b, c, f

20.  $7.7 \times 10^4\text{g}$