

## 1<sup>st</sup> Practice Exam

1. What is the density of a metal if a 15.4 gram sample has a volume of 1.96 cm<sup>3</sup>?
  - a. 0.127 g/cm<sup>3</sup>
  - b. 0.511 g/cm<sup>3</sup>
  - c. 7.86 g/cm<sup>3</sup>
  - d. 30.2 g/cm<sup>3</sup>
  - e. 33.1 g/cm<sup>3</sup>
2. A student does a calculation using her calculator and the number 280.27163 is shown on the display. If there are actually three significant figures, how should she show the final answer?
  - a. 280
  - b. 280.3
  - c. 280.27
  - d.  $2.80 \times 10^{-2}$
  - e.  $2.80 \times 10^2$
3. Which of the following is an example of a chemical change?
  - a. water boiling
  - b. ice melting
  - c. natural gas burning
  - d. iodine vaporizing
  - e. dry ice subliming
4. The element chlorine is obtained for commercial use by the following method:
  - a. Isolation from gas pockets in the earth's crust.
  - b. Separation from air by a high pressure technique.
  - c. Filtration of brine (NaCl) solutions.
  - d. Electrolysis of aqueous NaCl solutions.
  - e. Mixing sulfur and argon in equal quantities.

5. The density of a sodium sulfate solution is  $1.07 \text{ g/cm}^3$ . The solution is 8.00% sodium sulfate by mass. How many  $\text{cm}^3$  of the solution are needed to supply 4.28 g of sodium sulfate?
- $30.0 \text{ cm}^3$
  - $35.0 \text{ cm}^3$
  - $40.0 \text{ cm}^3$
  - $45.0 \text{ cm}^3$
  - $50.0 \text{ cm}^3$
6. In the Millikan oil drop experiment, the charge on oil droplets was observed by their behavior between a positively charged plate and a negatively charged plate. The fundamental charge on an electron was determined as  $-1.60 \times 10^{-19}$  coulombs by observing that:
- the charge on all the droplets was a multiple of  $1.60 \times 10^{-19}$  coulombs.
  - the charge on all the droplets was  $-1.60 \times 10^{-19}$  coulombs.
  - the charge on all the droplets was  $+1.60 \times 10^{-19}$  coulombs.
  - the charge on all the droplets was  $+1.60 \times 10^{19}$  coulombs.
  - the charge on all the droplets was  $-1.60 \times 10^{19}$  coulombs.
7. Which of the following is **NOT** an element of the fourth period in the periodic table?
- Co
  - V
  - Mg
  - Ca
  - Kr
8. Zinc has a density of  $7.14 \text{ g/cm}^3$ . If you have a piece of zinc that is 0.20 cm thick, 1.5 cm wide, and 3.0 cm long, how many moles of zinc are present?
- 0.0098 mol
  - 0.098 mol
  - 0.21 mol
  - 2.1 mol
  - 21 mol

9. The number of neutrons in 30 molecules of  $\text{As}_4$  where As has the mass number of 75 is
- 9000.
  - 6720.
  - 5040.
  - 3960.
  - 1760.
10. Which of the following elements are in the same chemical family?
- Rn, Ba, Sr, Be
  - N, O, F, Ne
  - Li, Be, Na, Mg
  - Ge, As, Sb, Te
  - Si, Sn, C, Pb
11. How many moles of fluorine **molecules** are in 5.00 grams of elemental fluorine?
- 0.132 mol
  - 0.263 mol
  - 3.80 mol
  - $1.07 \times 10^{-2}$  mol
  - $5.35 \times 10^{-4}$  mol
12. Which of the following contains the largest number of molecules: 6.00 g  $\text{CH}_4$ , 9.00 g  $\text{H}_2\text{O}$ , 15.0 g  $\text{NO}_2$ , 11.0 g  $\text{C}_2\text{H}_6$ , or 20.0 g  $\text{C}_2\text{H}_5\text{OH}$ ?
- $\text{CH}_4$
  - $\text{H}_2\text{O}$
  - $\text{NO}_2$
  - $\text{C}_2\text{H}_6$
  - $\text{C}_2\text{H}_5\text{OH}$

13. The percentage of water in an unknown hydrate was determined by heating the sample and driving the water off the sample. Two independent measurements gave values of 19.564 and 21.731%. Its percentage should be reported as:
- a. 21%
  - b. 20.6%
  - c. 20.65%
  - d. 21.648%
  - e. 20.6475%
14. What is the mass number of an atom of iodine with 76 neutrons?
- a. 106
  - b. 53
  - c. 129
  - d. 258
  - e. 76
15. In 0.50 mole of methyl formate,  $\text{HCOOCH}_3$ , there are
- a.  $6.0 \times 10^{23}$  molecules.
  - b.  $1.2 \times 10^{24}$  molecules.
  - c.  $1.8 \times 10^{24}$  atoms.
  - d.  $2.4 \times 10^{24}$  atoms.
  - e.  $4.8 \times 10^{24}$  atoms.