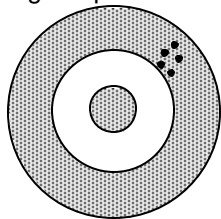


2 • What Can We Measure About Chemicals?

PRACTICE TEST

1. The following target represents someone who is:



- a) accurate, but not precise
- b) precise, but not accurate
- c) both precise and accurate
- d) neither precise, nor accurate

2. How close a measurement is to the true value is the _____ of the measurement and is communicated as _____

- a) accuracy, % error
- b) accuracy, \pm notation
- c) precision, % error
- d) precision, \pm notation

3. Consider the following data:

mass of slab	35.24 g
length of slab	35.14 cm
width of slab	15.85 cm
height of slab	0.68 cm

What is the density of the slab? Show work.

4. Several students measure the mass of an object.

Here is their data:

15.25 g, 16.00 g, 14.95 g, 15.15 g, 15.72 g

This data should be reported as:

_____ \pm _____ g

5. Which one of the following elements is diatomic?

- a) Cl
- b) S
- c) Mg
- d) C

6. Convert 0.00527 km into cm. Show work.

7. The accepted value for the density of aluminum is 2.70 g/cm^3 . Your measurements indicate that the density is 2.80 g/cm^3 . What is the percent error?

Is this an indication of the accuracy or precision of the measurement?

8. The measured density of aluminum is actually $2.80 \pm 0.03 \text{ g/cm}^3$. Is the \pm value an indication of the accuracy or precision of the measurement?

9. Write the following in scientific notation:

5000 g _____

0.00350 L _____

45.8 kg _____

0.0000000262 km _____

$375 \times 10^3 \text{ mL}$ _____

10. Equal volumes of gas, measured at the same temperature and pressure, contain equal _____ of particles.
- a) numbers c) masses
b) volumes d) velocities
11. What is the molar mass of CaCO_3 ?
[Ca = 40.08, C = 12.01, O = 16.00]
- a) 68.1 g d) 106.0 g
b) 312.2 g e) 100.1 g
c) 56.0 g
12. The molar mass of aluminum sulfate, $\text{Al}_2(\text{SO}_4)_3$, is
[Al = 27.0, S=32.1, O = 16.0]
- a) 342 g c) 150 g
b) 246 g d) 123 g
13. A mole of oxygen gas, O_2 , is compared with a mole of solid lead, Pb. You can be certain that the two samples have the same...
- a) volume. c) number of particles.
b) mass. d) all of the above.
14. Which one of the following statements is **NOT** correct about a mole of CO_2 gas.
[C = 12.0, O = 16.0]
- a) It contains 6.02×10^{23} molecules.
b) It has a mass of 44.0 grams
c) It has a volume of 24.6 Liters @ STP
15. A mylar balloon with a volume of 2.75 Liters requires ___ moles of helium gas to fill it at 0°C & 760 mmHg.
- a) 0.123 moles c) 0.688 moles
b) 2.18 moles d) 1.45 moles
16. Milk of magnesia contains the chemical, magnesium hydroxide, $\text{Mg}(\text{OH})_2$. If a bottle contains 35.0 g of $\text{Mg}(\text{OH})_2$, how many molecules does it contain?
[$\text{Mg}(\text{OH})_2 = 58.3 \text{ g/mole}$]
- a) 6.02×10^{23} c) 1.00×10^{24}
b) 5.80×10^{22} d) 3.61×10^{23}
17. What volume would 5.25 moles of CO_2 occupy at STP?
- a) 231 L c) 0.234 L
b) 118 L d) 0.119 L
18. A 1.00 Liter sample of a gas (measured at STP) has a mass of 4.65 g. Its molar mass is
- a) 104.2 g/mol c) 44.0 g/mol
b) 204.6 g/mol d) 28.0 g/mol
19. Calculate the percentage composition of boron, B, in the compound boron trifluoride, BF_3 . [B = 10.81, F = 19.00]
- a) 15.95 % c) 19.0 %
b) 25.0 % d) 56.9 %
20. What is the percent nitrogen in ammonium carbonate, $(\text{NH}_4)_2\text{CO}_3$?
- a) 14.53% c) 27.83%
b) 29.16% d) 33.34%