UNIT 2 QUANTITIES IN CHEMISTRY

ARE YOU READY?

(Pages 76–77)

Knowledge and Understanding

1.

IUPAC name	Chemical formula	Element or compound
oxygen	O_2	element
ammonia	NH_3	compound
carbon dioxide	CO_2	compound

2.

Compound formula	IUPAC name
NaCl	sodium chloride
$CaBr_2$	calcium bromide
Al_2S_3	aluminum sulfide
Na_2SO_4	sodium sulfate
$(NH_4)_2CO_3$	ammonium carbonate
$KClO_3$	potassium chlorate
$Cu_3(PO_4)_2$	copper(II) phosphate

3. (a) single displacement reaction
   (b) double displacement reaction
   (c) combustion reaction
   (d) synthesis reaction
4. magnesium + hydrochloric acid → magnesium chloride + hydrogen
5. (a) $2\ Na_{(s)} + F_{2(g)} \rightarrow 2\ NaF_{(s)}$
   (b) $16\ Al_{(s)} + 3\ S_{8(s)} \rightarrow 8\ Al_2S_{3(s)}$
   (c) $7\ CO_{(g)} + 14\ H_{2(g)} \rightarrow C_7H_{14(l)} + 7\ H_2O_{(l)}$
6. (a) $Ca_{(s)} + 2\ H_2O_{(l)} \rightarrow Ca(OH)_{2(s)} + H_{2(g)}$
   (b) $Pb(NO_3)_{2(aq)} + 2\ KI_{(aq)} \rightarrow PbI_{2(s)} + 2\ KNO_{3(aq)}$

Inquiry and Communication

7. symbol 1 = Class D: Toxic Materials Immediate and Severe
   symbol 2 = Class B: Flammable and Combustible Materials
   symbol 3 = Class F: Dangerously Reactive Materials
   symbol 4 = Class C: Oxidizing Materials
8. (a) A dark red precipitate forms as the contents of flask A are added to the contents of flask B.
   (b) 317.26 g
   (c) The student is trying to test the law of conservation of mass in a chemical reaction.
   (d) The total mass of the products could appear to be less than the total mass of reactants if some of the solution in flask A spilled or splattered when it was added to the solution in flask B in part 3. The product mass could also appear to be less if flask B in part 4 was left open for a period of time before its mass was measured. In this case, some of the liquid in the flask might evaporate.

Math Skills

9.

Decimal	Scientific
0.010 m	1.0×10^{-2} m
401 mL	4.01×10^{2} mL
385.5 g	3.855×10^{2} g

10. (a) $\frac{9}{y} = \frac{3}{2}$

$y = 9\left(\frac{2}{3}\right)$

$y = 6$

The value of y is 6.

(b) $\%\ \text{girls} = \frac{657}{1093} \times 100\%$

$\%\ \text{girls} = 60.1\%$

There are 60.1% girls in the school.

(c) 7.38×10^{7} g/mL

11.