

UNIT 3 ORGANIC CHEMISTRY






ARE YOU READY?

(Pages 176–177)

- The gas is oxygen.
 - The gas is carbon dioxide.
 - The gas is hydrogen.
 - The gas is water (vapour).
- $\text{HCl}_{(\text{aq})} + \text{NaOH}_{(\text{aq})} \rightarrow \text{NaCl}_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$
 - $\text{H}_2\text{SO}_{4(\text{aq})} + 2 \text{KOH}_{(\text{aq})} \rightarrow \text{K}_2\text{SO}_{4(\text{aq})} + 2 \text{H}_2\text{O}_{(\text{l})}$
- Two chlorine atoms will form a covalent bond because they are both nonmetals and share electrons.
 - Potassium and iodine will form an ionic bond because potassium is a metal and iodine is a nonmetal. Potassium will transfer its valence electron to iodine. The electrostatic force of attraction between the two resulting ions will form an ionic bond.
 - Carbon and oxygen are nonmetals. They will share electrons and therefore form covalent bonds.
 - Magnesium and fluorine will form ionic bonds. Magnesium will lose its two valence electrons to two fluorine atoms. The electrostatic force of attraction between the resulting ions will form an ionic bond.
- $$\text{:}\ddot{\text{O}} = \ddot{\text{O}}\text{:}$$
 - $$\begin{array}{c} \text{H} \\ | \\ \text{H} - \text{C} - \text{H} \\ | \\ \text{H} \end{array}$$
 - $$\begin{array}{c} \text{H} - \ddot{\text{N}} - \text{H} \\ | \\ \text{H} \end{array}$$
- O–H
 - C–O
 - C–H
 - O–H
 - H–F
- $4 \text{NH}_{3(\text{g})} + 5 \text{O}_{2(\text{g})} \rightarrow 4 \text{NO}_{(\text{g})} + 6 \text{H}_2\text{O}_{(\text{l})}$
 - $3 \text{NO}_{2(\text{g})} + \text{H}_2\text{O}_{(\text{l})} \rightarrow 2 \text{HNO}_{3(\text{g})} + \text{NO}_{(\text{g})}$
 - $\text{C}_{12}\text{H}_{22}\text{O}_{11(\text{s})} + 12 \text{O}_{2(\text{g})} \rightarrow 12 \text{CO}_{2(\text{g})} + 11 \text{H}_2\text{O}_{(\text{l})}$
 - $\text{C}_6\text{H}_{6(\text{l})} + 3 \text{Cl}_{2(\text{g})} \rightarrow \text{C}_6\text{H}_3\text{Cl}_{3(\text{l})} + 3 \text{HCl}_{(\text{g})}$

7.

Table 1

Class and type of compound	WHMIS symbol	Risks	Precautions
Class A		could explode due to pressure could explode if heated or dropped possible hazard from both the force of explosion and the release of contents	ensure container is always secured store in designated areas do not drop or allow to fall
Class B		may ignite spontaneously may release flammable products if allowed to degrade or when exposed to water	store in designated areas work in well-ventilated areas avoid heating avoid sparks and flames ensure that electrical sources are safe
Class C		can cause skin or eye burns increased fire and explosion hazards may cause combustibles to explode or react violently	store away from combustibles wear body, hand, face, and eye protection store in container that will not rust or oxidize
Class D		may cause death or permanent injury may cause birth defects or sterility small volumes have a toxic effect may cause cancer may be sensitizers causing allergies	wear appropriate personal protection work in a well-ventilated area store in appropriate designated areas avoid direct contact use hand, body, face, and eye protection ensure respiratory and body protection is appropriate for the specific hazard
Class E		eye and skin irritation on exposure severe burns/tissue damage on longer exposure lung damage if inhaled may cause blindness if contacts eyes environmental damage from fumes	wear body, hand, face, and eye protection use breathing apparatus ensure protective equipment is appropriate work in a well-ventilated area avoid all direct body contact use appropriate storage containers and ensure nonventing closures