

Unit 5 Electrochemistry

ARE YOU READY?

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Safety and Technical Skills

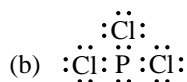
1. Check all connections and make sure that the equipment is in good condition with no frayed cords or damaged plugs.
2. To handle electrical equipment safely, water or wet hands should never be used near electrical equipment and wires and cords should not be placed where someone could trip over them.

Knowledge and Understanding

3. When a metal atom forms an ion, the atom loses electrons to form a positively charged ion.
4. When a nonmetal atom forms an ion, the atom gains electrons to form a negatively charged ion.
- 5.

Table 1 Reactivity of Elements

Category	Groups or examples
most reactive metals	alkali metals
least reactive metals	precious metals, i.e., silver, gold, platinum
most reactive nonmetals	halogens
least reactive nonmetals	noble gases



- (c) In part (a), the potassium atom transfers one electron to the chlorine atom, forming a potassium ion and a chloride ion.
In part (b), the phosphorus atom shares two electrons with each of three chlorine atoms, thereby forming a neutral molecule.
- (d) According to bonding theory, the difference in electronegativity between two atoms is believed to determine whether they will transfer or share electrons.
7. (a) element + compound \rightarrow element + compound
(b) The product is the same class of element as the reactant; that is, the product is a metal when the reactant element is a metal, and the product is a nonmetal when the reactant element is a nonmetal.
8. (a) $\text{Zn}_{(\text{s})} + 2 \text{AgNO}_{3(\text{aq})} \rightarrow 2 \text{Ag}_{(\text{s})} + \text{Zn}(\text{NO}_3)_{2(\text{aq})}$
(b) $\text{Cl}_{2(\text{aq})} + 2 \text{KBr}_{(\text{aq})} \rightarrow \text{Br}_{2(\text{aq})} + 2 \text{KCl}_{(\text{aq})}$
(c) $2 \text{Al}_{(\text{s})} + 6 \text{HCl}_{(\text{aq})} \rightarrow 3 \text{H}_{2(\text{g})} + 2 \text{AlCl}_{3(\text{aq})}$
(d) $\text{C}_3\text{H}_{8(\text{g})} + 5 \text{O}_{2(\text{g})} \rightarrow 3 \text{CO}_{2(\text{g})} + 4 \text{H}_2\text{O}_{(\text{g})}$

Inquiry and Communication

9. (a) Iodine is likely present.
(b) Bromine is likely present.
(c) The solution is acidic.
(d) The solution is basic.
(e) Copper(II) ions are likely present.
(f) Sodium ions are likely present.