Quiz (Displacement Reaction)

Predict whether a reaction takes place in each of the following experiments. State an expected observation (if any) and write a chemical equation and an ionic equation for the reaction involved.

(a) Zinc granules are added to magnesium chloride solution.

(b) An iron nail is added to copper(II) sulphate solution.

(c) A magnesium ribbon is added to silver nitrate solution.

Suggested Answer

1. (a) No reaction occurs.

Zinc is lower than magnesium in the metal reactivity series.

(b) A reaction takes place. The iron nail is coated with a reddish-brown layer. The blue solution gradually turns green.

$Fe(s) + CuSO_4(aq) \longrightarrow FeSO_4(aq) + Cu(s)$

$Fe(s) + Cu^{2+}(aq) \longrightarrow Fe^{2+}(aq) + Cu(s)$

(c) A reaction takes place.
Shiny silvery deposits form on the surface of the magnesium ribbon.

$Mg(s) + 2AgNO_3(aq) \longrightarrow Mg(NO_3)_2(aq) + 2Ag(s)$

$Mg(s) + 2Ag^{+}(aq) \longrightarrow Mg^{2+}(aq) + 2Ag(s)$