Answer on #71488, Chemistry / General Chemistry

Question : Specify which of the following are oxidation-reduction reactions, and if it is, identify the oxidizing agent, the reducing agent, the substance being oxidized, and the substance being reduced. If it is not, select No and leave the following boxes blank. Express your answers as a chemical formulas. Omit states-of-matter.

Zn(s) + 2Ag+(aq) ---2Ag(s) + Zn2+(aq)

Redox? Oxidizing Agent? Reducing Agen?t Substance Oxidized? Substance Reduced?

Solution:

Zn being more active than silver (refer to activity series[1]) and will act as a reducing agent and supplies electrons

$$\mathrm{Zn(s)_{reducing\ agent}} \rightarrow \mathrm{Zn^{2+}(aq)} + \mathrm{2e^{-}\}\ oxidation = loss\ of\ electrons}$$

$$2Ag^{+}(aq)_{\mathrm{oxidising\ agent}} + \mathrm{2e^{-}} \rightarrow \mathrm{2Ag\ (s)\}\ reduction = gain\ of\ electrons}$$

So Zn (s) is oxidized to Zn^{2+}(aq) ions, and it act as a reducing agent. Ag^{+} (aq) is reduced to silver metal Ag (s) and it act as an oxidizing agent. So there is a reduction/oxidation reaction (RedOx).

Answer: Redox – Yes, Zn (s) – reducing agent, substance oxidized, Ag^{+} -oxidizing agent, substance reduced.

Source:

1. https://en.wikipedia.org/wiki/Reactivity_series