Quiz (Electrochemical Series)

1. A student mixed solutions of halogens and halide ions to determine the relative oxidizing strengths of the halogens. The following table summarizes his findings:

	Potassium iodide solution	**Potassium bromide solution**	**Potassium chloride solution**
Addition of aqueous chlorine	colourless solution changed to brown	colourless solution changed to yellowish brown	–
Addition of aqueous bromine	colourless solution changed to brown	–	no observable change
Addition of aqueous iodine	–	no observable change	no observable change

   Arrange the oxidizing power of chlorine, bromine and iodine in ascending order. Explain your answer.

2. When chlorine water is added to potassium iodide solution, a redox reaction occurs.
   (a) Describe and explain the colour change in the reaction.

   (b) Write an ionic equation for the reaction.

   (c) Name the oxidizing agent in the reaction.

Suggested Answer

1. Chlorine displaces bromine and iodine out from the potassium bromide solution and the potassium iodide solution respectively. Thus, the oxidizing power of chlorine is higher than that of bromine and iodine.

   Bromine displaces iodine out from the potassium iodide solution. Thus, the oxidizing power of bromine is higher than that of iodine.

   ∴ the oxidizing power is in the order: iodine < bromine < chlorine

2. (a) The colourless potassium iodide solution changes to brown.
   Chlorine is a stronger oxidizing agent than iodine.
   It displaces iodine out from potassium iodide solution.

   (b) $Cl_2(aq) + 2I^-(aq) \longrightarrow 2Cl^-(aq) + I_2(aq)$

   (c) Chlorine water