Chemistry 1.8 AS 91167 Demonstrate understanding of oxidation-reduction

Practice paper 1

Success Criteria: complete each level before moving onto the next

- Write half equations (identify from question)
- Use oxidation numbers to identify oxidant (reduced) and reductant (oxidised)
- Complete practical and observe reactant/product colour for each species
- Write full observation linked to species for the reaction
- Write balanced half equations then full equation for REDOX reaction

Sample Question When potassium dichromate solution is mixed with iron (ii) sulfate solution the orange solution changes to a green colour. Explain these observations.

$Cr_2O_7^{2-} \rightarrow Cr^{3+}$ (The reactants are given but you will have to remember the products)

$Fe^{2+} \rightarrow Fe^{3+}$

ON = $Cr_2O_7^{2-}$ (+6) → Cr^{3+} (+3) Reduced (oxidant) ON= Fe^{2+} (+2) → Fe^{3+} (+3) oxidised (reductant)

$Cr_2O_7^{2-}$ (orange) → Cr^{3+} (green) Fe^{3+} (rust orange) → Fe^{2+} (pale green)

Orange dichromate ion, $Cr_2O_7^{2-}$ is reduced to green chromate ion, Cr^{3+} and the rust orange Fe^{2+} ion is oxidised to pale green Fe^{3+} ion, so over all, the colour is from an **orange solution to a green solution**

$14H^+$ + $Cr_2O_7^{2-}$ + ~~**6e-**~~ → **$2Cr^{3+}$** + **$7H_2O$**

(**$6Fe^{2+}$** → **$6Fe^{3+}$** + ~~**6e-**~~) x 6

$14H^+$ + $Cr_2O_7^{2-}$ + **$6Fe^{2+}$** → **$2Cr^{3+}$** + **$7H_2O$** + **$6Fe^{3+}$**

1. Mix potassium permanganate solution (acidified) with sodium sulphite solution. Record observations and link to species oxidised and reduced. Show Oxidation numbers

Reduced species: _____

Oxidised species: _____

Observation linked to species: _____

_____

_____

_____

_____

Balanced equations:

_____

_____

_____

2. Mix hydrogen peroxide solution with potassium iodide solution. Record observations and link to species oxidised and reduced. Show Oxidation numbers