



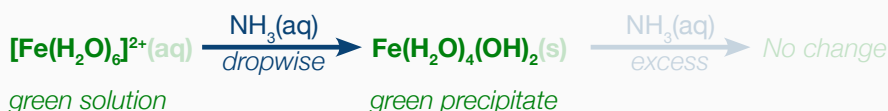
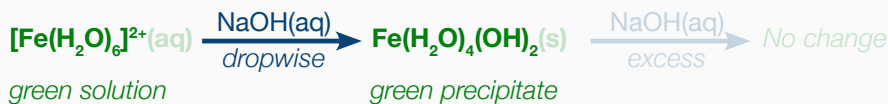
# Inorganic Revision Sheet

## Metal Aqua Ion Reactions for OCR (A)

### $\text{Fe}^{2+}$ , $\text{Fe}^{3+}$ , $\text{Cu}^{2+}$ , $\text{Cr}^{3+}$ and $\text{Mn}^{2+}$

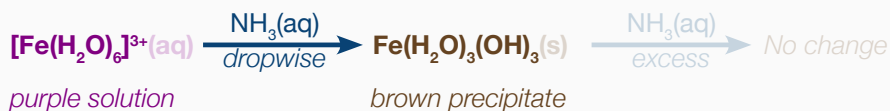
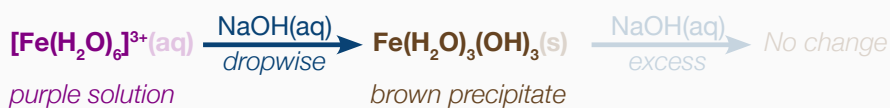
#### Iron (II), $\text{Fe}^{2+}$

dropwise NaOH or  $\text{NH}_3$  = green ppt  
excess NaOH = no change  
excess  $\text{NH}_3$  = no change



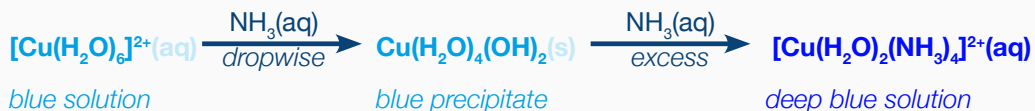
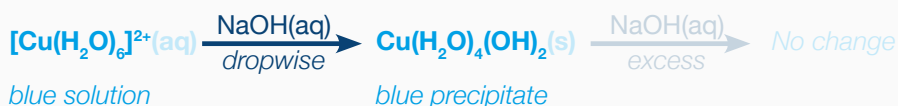
#### Iron (III), $\text{Fe}^{3+}$

dropwise NaOH or  $\text{NH}_3$  = brown ppt  
excess NaOH = no change  
excess  $\text{NH}_3$  = no change



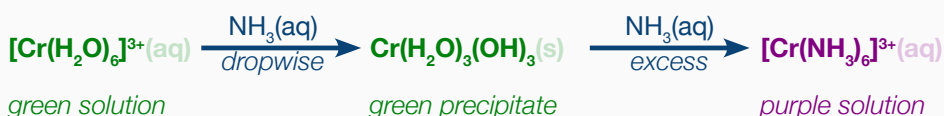
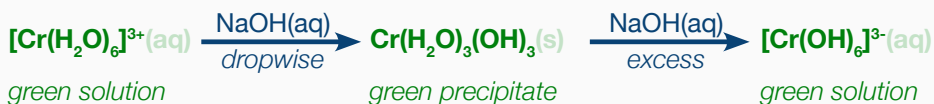
#### Copper (II), $\text{Cu}^{2+}$

dropwise NaOH or  $\text{NH}_3$  = blue ppt  
excess NaOH = no change  
excess  $\text{NH}_3$  = deep blue solution



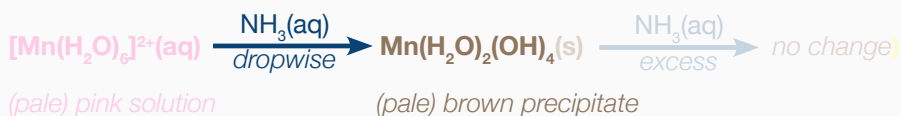
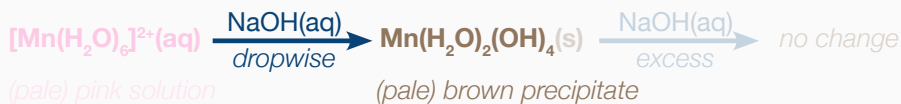
#### Chromium (III), $\text{Cr}^{3+}$

dropwise NaOH or  $\text{NH}_3$  = green ppt  
excess NaOH = green solution  
excess  $\text{NH}_3$  = purple solution



#### Manganese (II), $\text{Mn}^{2+}$

dropwise NaOH or  $\text{NH}_3$  = brown ppt  
excess NaOH = no change  
excess  $\text{NH}_3$  = no change





# Inorganic Revision Sheet

## Metal Aqua Ion Reactions for OCR (A)

### Changing Oxidation States



$\text{Fe}^{2+}(\text{aq})$  can be oxidised to  $\text{Fe}^{3+}(\text{aq})$  by  $\text{H}^+/\text{MnO}_4^-$



$\text{Fe}^{3+}(\text{aq})$  can be reduced to  $\text{Fe}^{2+}(\text{aq})$  by  $\text{I}^-$



$\text{Cr}^{3+}(\text{aq})$  can be oxidised to  $\text{CrO}_4^{2-}(\text{aq})$  with  $\text{H}_2\text{O}_2 / \text{OH}^-$   
 $\text{CrO}_4^{2-}(\text{aq})$  is easily converted to  $\text{Cr}_2\text{O}_7^{2-}$  with addition of  $\text{H}^+$



$\text{Cr}_2\text{O}_7^{2-}(\text{aq})$  can be reduced to  $\text{Cr}^{3+}(\text{aq})$  with  $\text{Zn} / \text{H}^+$



$\text{Cu}^{2+}(\text{aq})$  can be reduced to  $\text{Cu}^+(\text{aq})$  with  $\text{I}^-$   
 $\text{Cu}^+(\text{aq})$  disproportionates readily to  $\text{Cu}^{2+}(\text{aq})$  and  $\text{Cu}(\text{s})$

### Ligand Exchange

Copper (II),  $\text{Cu}^{2+}$



Chromium (III),  $\text{Cr}^{3+}$

