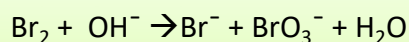


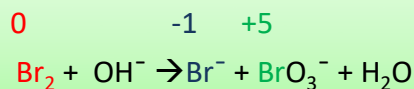
REDOX REACTIONS

Balancing Redox Reaction in Basic Medium



(Given equation is an example of disproportionation reaction as same element is undergoing oxidation as well as reduction)

Step 1: Write the Oxidation Numbers (ON) to identify oxidation and reduction half reactions

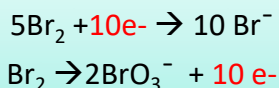


Step 2: Write oxidation and reduction half reactions separately. Balance atoms undergoing oxidation and reduction and show the electrons involved in the two half equations.

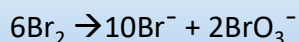
Reduction (i): $\text{Br}_2 + 2\text{e}^- \rightarrow 2\text{Br}^-$ (1 atom of Br undergoes a change in ON by 1, 2 atoms of Br total change in ON is by 2, Gain of 2 Electrons)

Oxidation (ii): $\text{Br}_2 \rightarrow 2\text{BrO}_3^- + 10\text{e}^-$ (Br ON inc by 5 for 1 atom, 2 atoms inc in ON is by 10, Loss of 10 electrons)

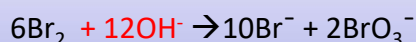
Step 3: Equate the gain and loss of e^- (In this case, Multiply eq (i) by 5)



Step 4: Add half equations (electrons cancel out)



Step 5: Balance charges (adding OH^- as this is basic medium)



Step 6: Add water to balance Oxygen (Hydrogen gets balanced automatically)

