Solutions

Each answer shows the steps, then the **result**.

2.1

- $Cl_2 + 2NaOH \rightarrow NaCl + NaClO + H_2O$

2.2

- HOCl (chloric(I) acid) / ClO^-

3.1 C

- Chlorine is both oxidised and reduced — disproportionation

3.2 C

- Chlorine in ClO^- is +1

3.3

(a)

- $3Cl_2 + 6NaOH \rightarrow 5NaCl + NaClO_3 + 3H_2O$

(b)

- Cl in NaCl = −1; Cl in $NaClO_3$ = +5; chlorine starts at 0 and is both reduced (to −1) and oxidised (to +5)

3.4

- chlorine reacts with water: $Cl_2 + H_2O \rightleftharpoons HOCl + HCl$; the HOCl/$ClO^-$ kills bacteria, making the water safe