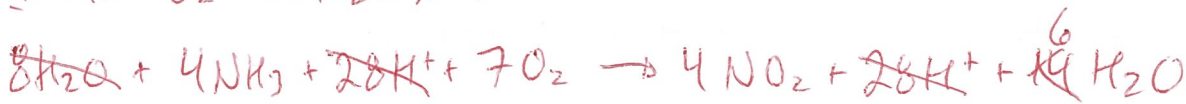
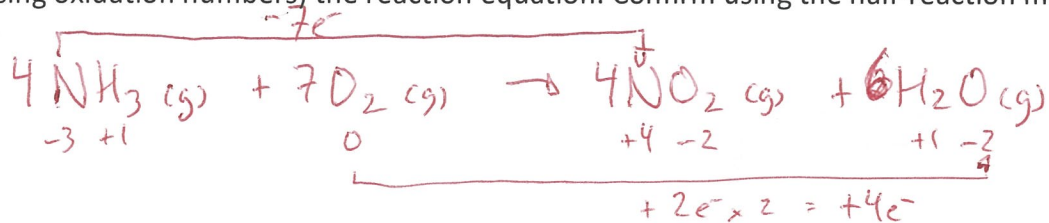


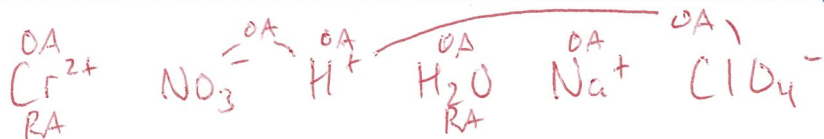
3. Ammonia gas undergoes combustion to produce nitrogen dioxide gas and water vapour. Write and balance (using oxidation numbers) the reaction equation. Confirm using the half-reaction method.



4. A 10.00 mL sample of acidified chromium (II) nitrate solution are titrated with a 0.350 mol/L solution of sodium perchlorate. Using the titration information below, determine the concentration of the sample.

Volume of titrant (sodium perchlorate solution) added.

Trial	1	2	3	4	5
Final burette reading (mL)	12.3	25.2	37.6	12.2	24.9
Initial burette reading (mL)	0.0	12.3	25.2	0.0	12.2
Volume added	12.3	12.9	12.4	12.2	12.7



$$C = 0.350 \text{ mol/L}$$

$$V = 12.3 \text{ mL}$$

$$n = CV$$

$$= 4.305 \text{ mmol} \times \frac{8}{1} = 34.44 \text{ mmol Cr}^{2+}$$

$$V = 10.00 \text{ mL}$$

$$n = 34.44 \text{ mmol}$$

$$C = \frac{n}{V} = \frac{34.44 \text{ mmol}}{10.00 \text{ mL}} = 3.444 \text{ mol/L}$$

$$\boxed{3.44 \text{ mol/L}}$$