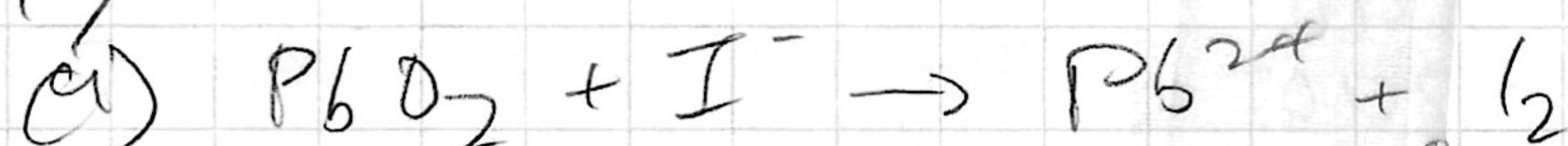
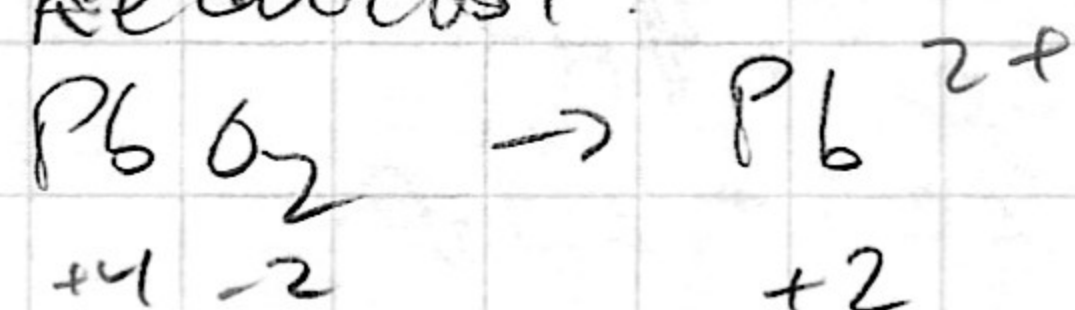


Max Shi
Post Lab 0 Questions

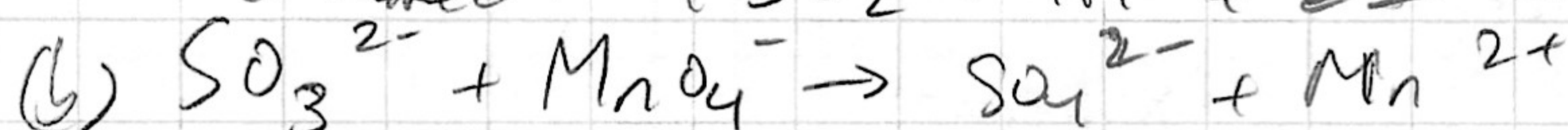
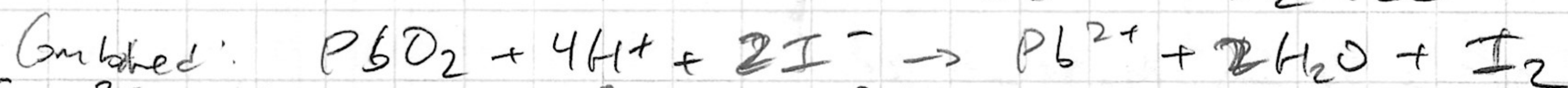
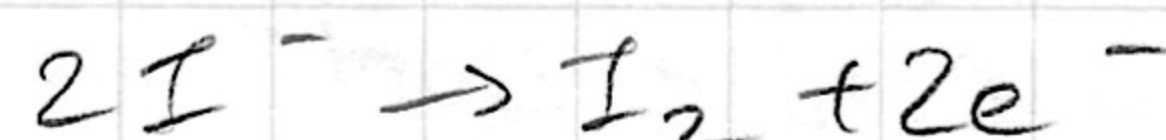
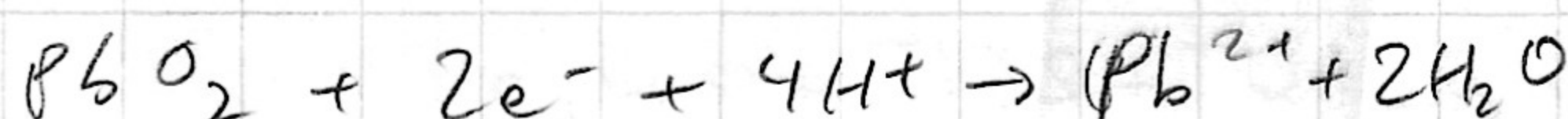
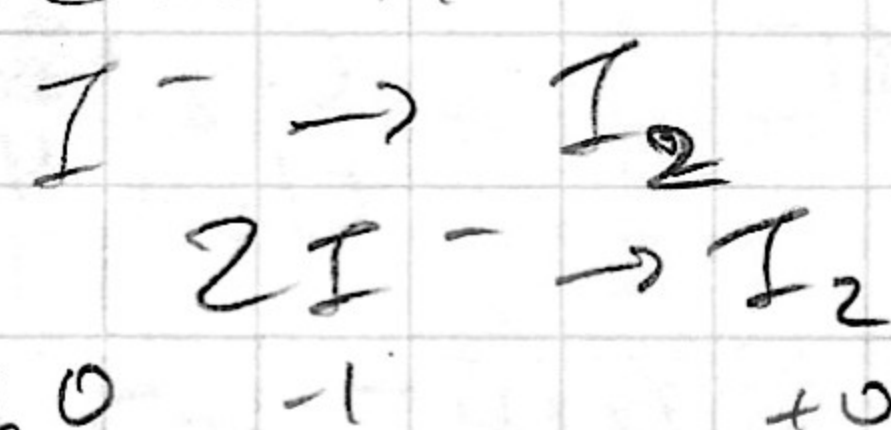
(Q1)



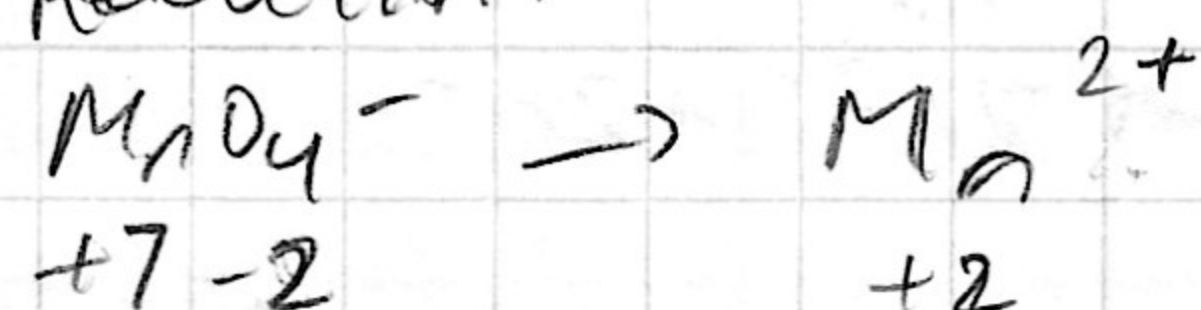
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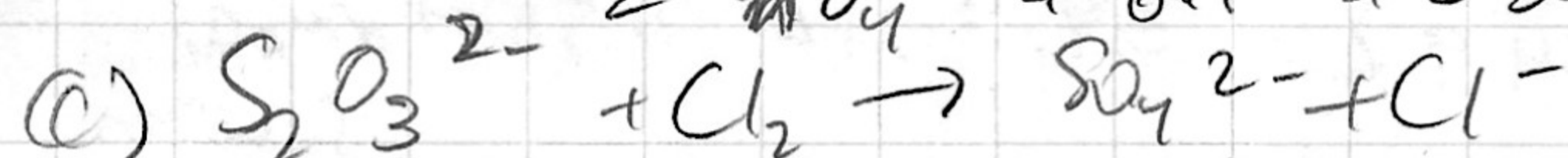
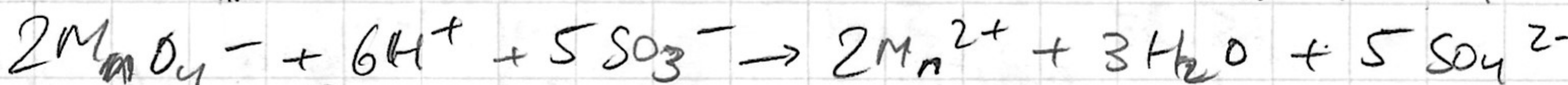
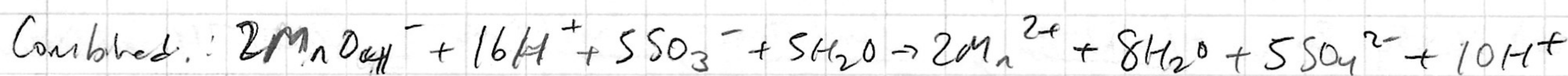
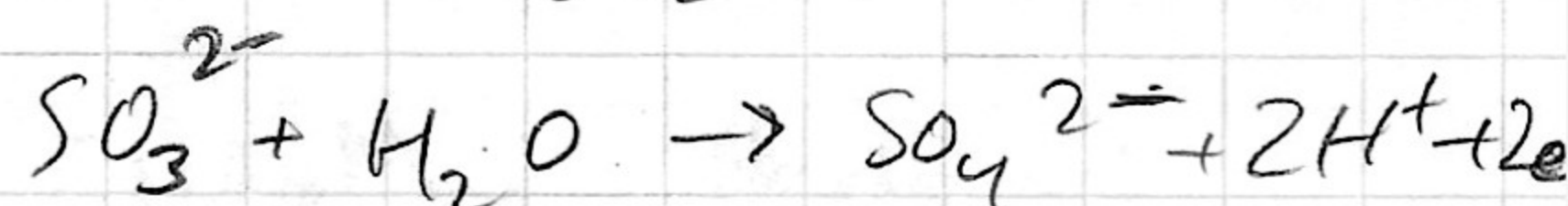
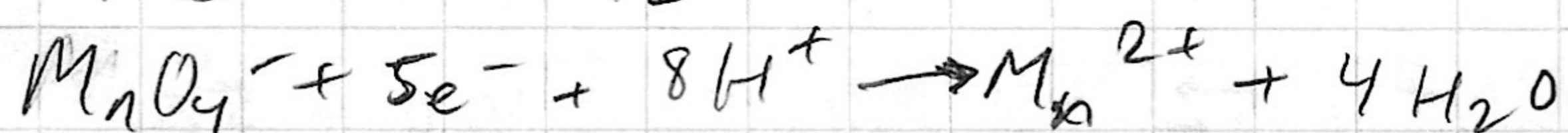
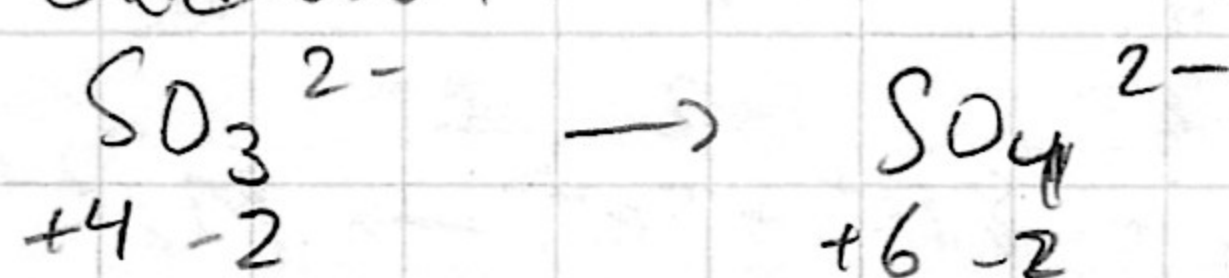
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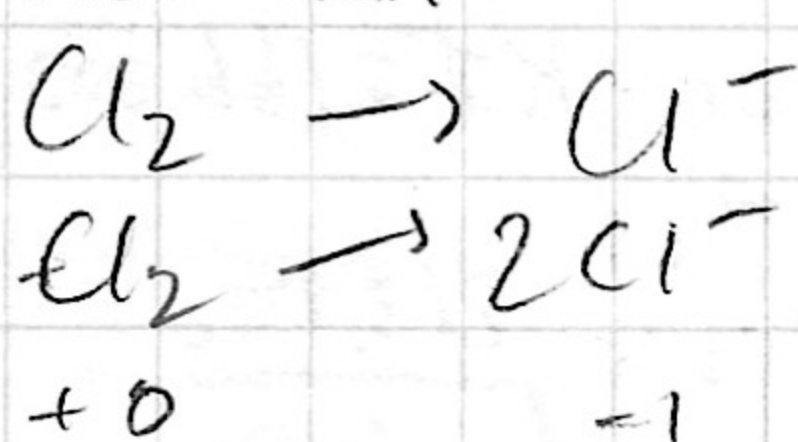
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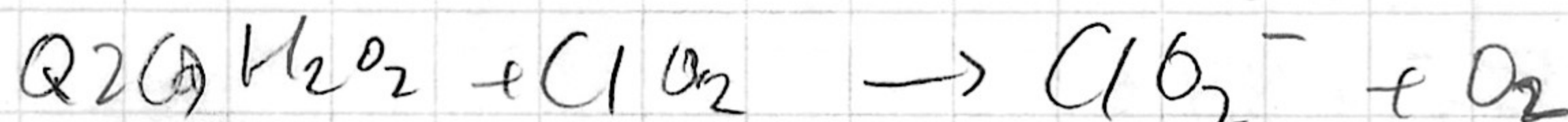
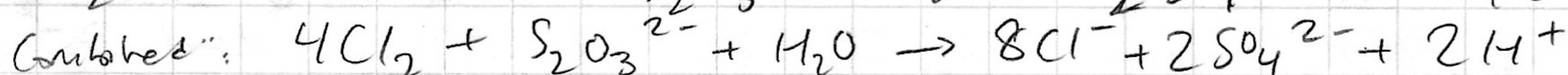
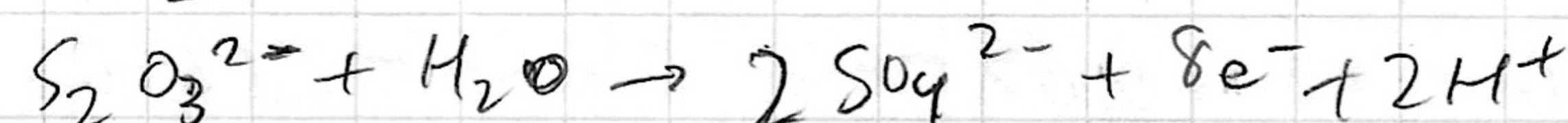
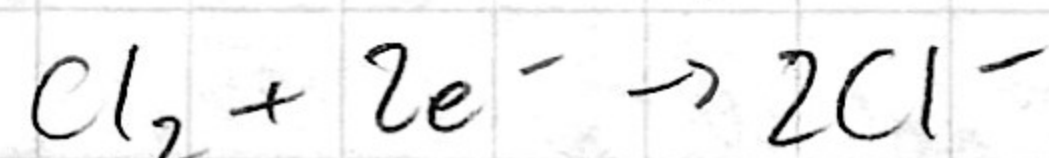
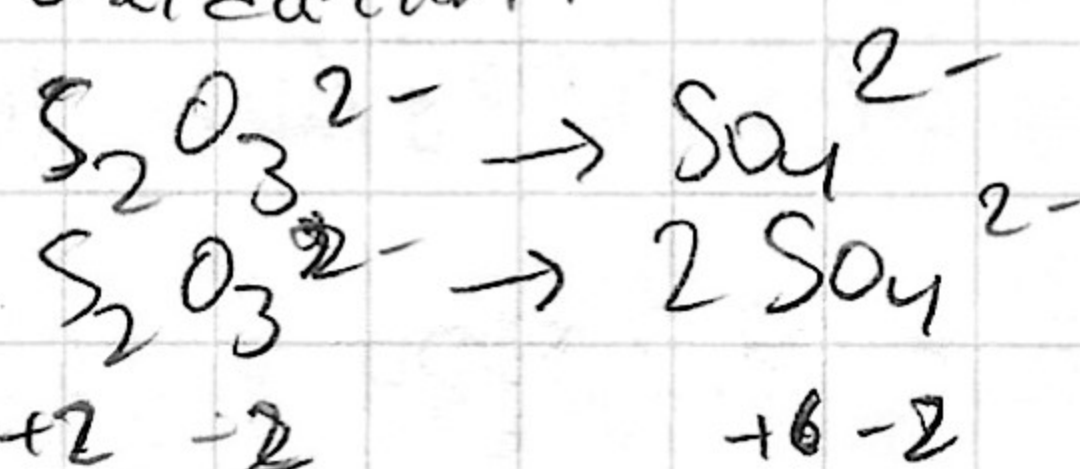
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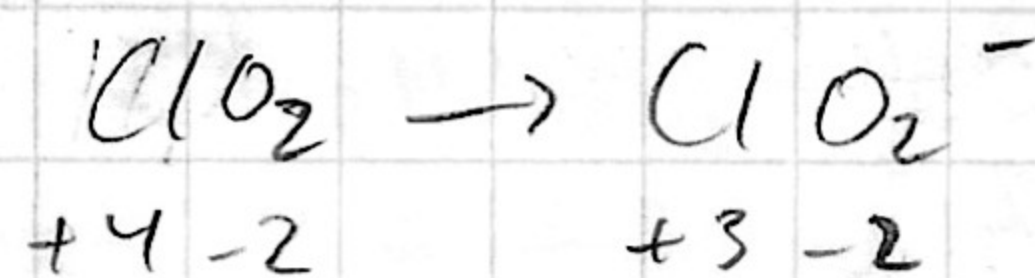
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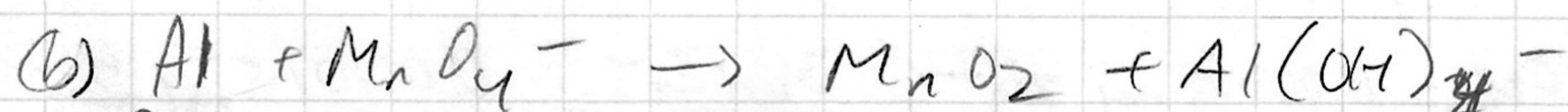
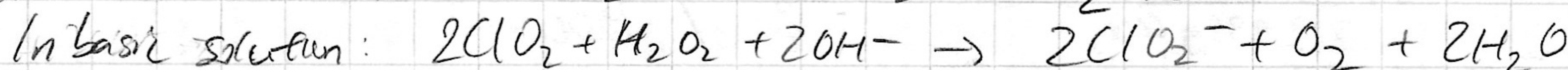
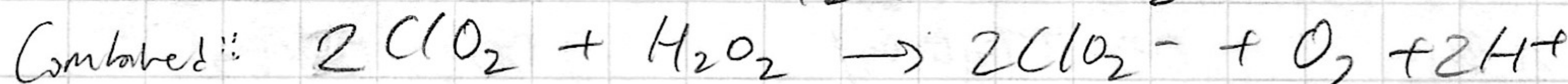
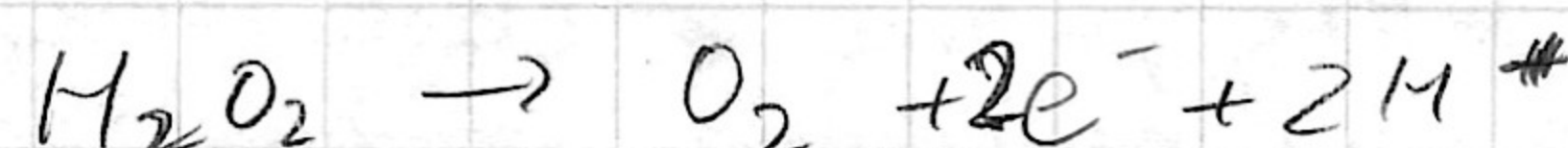
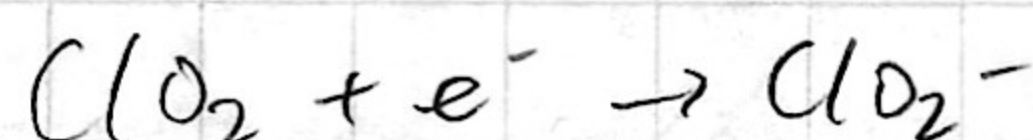
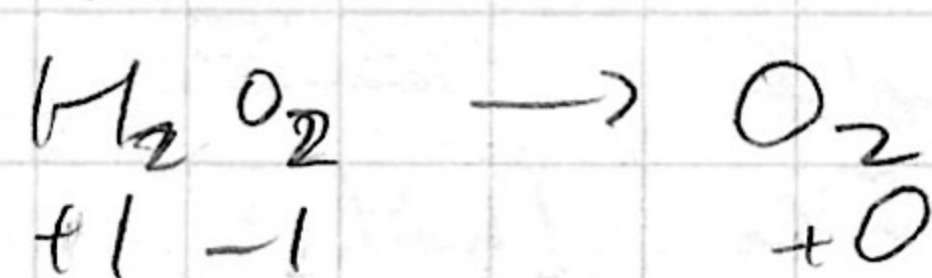
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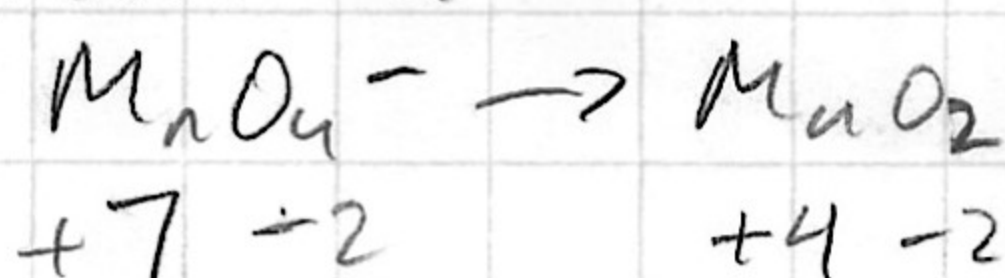
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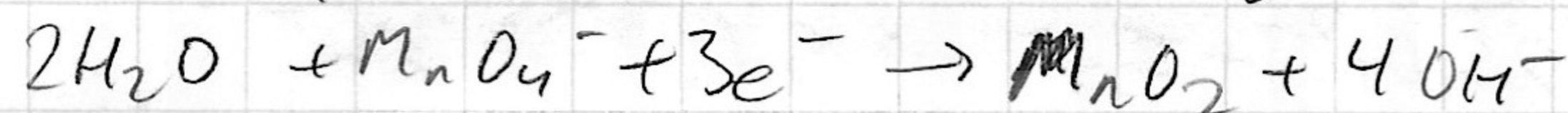
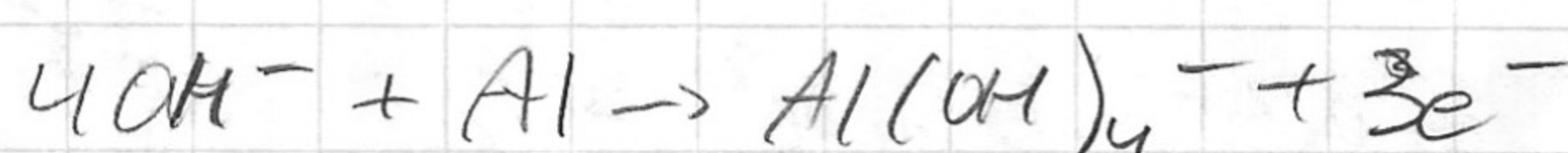
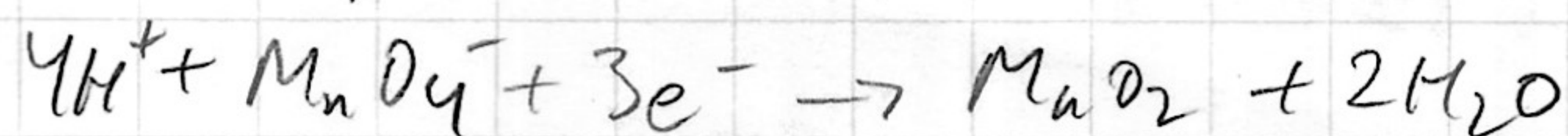
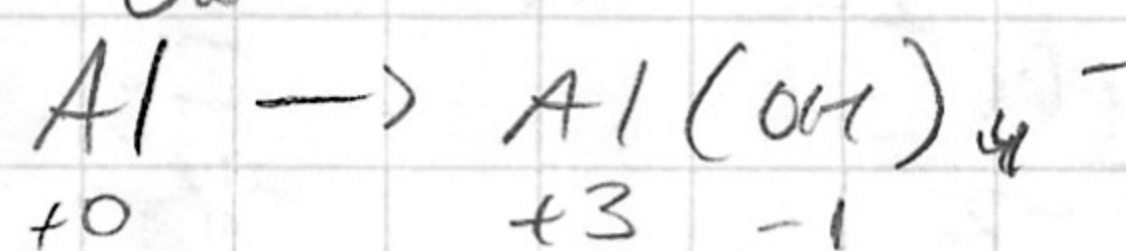
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Reduction

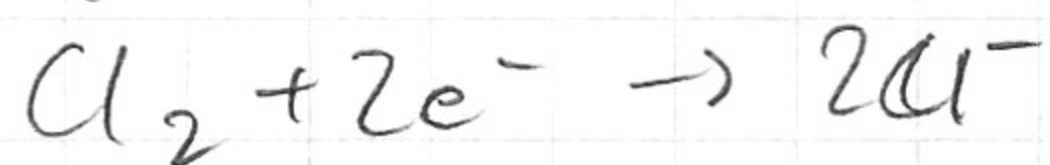
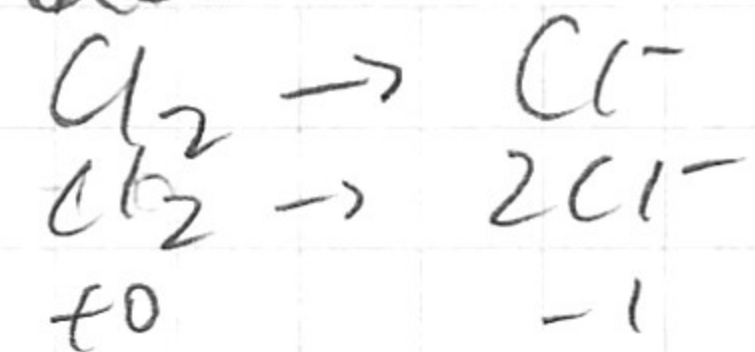


Oxidation:

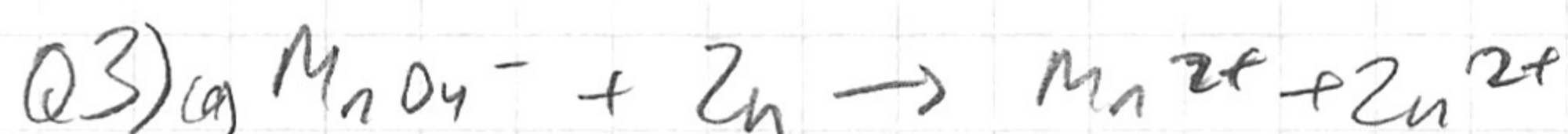
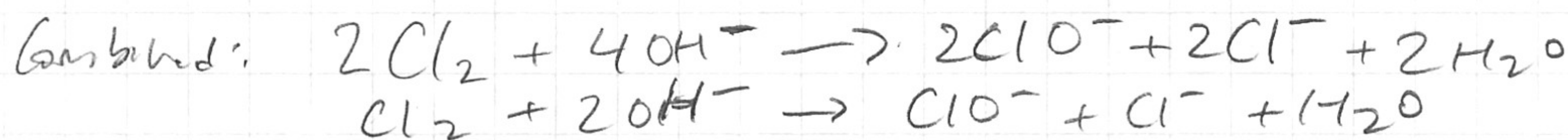
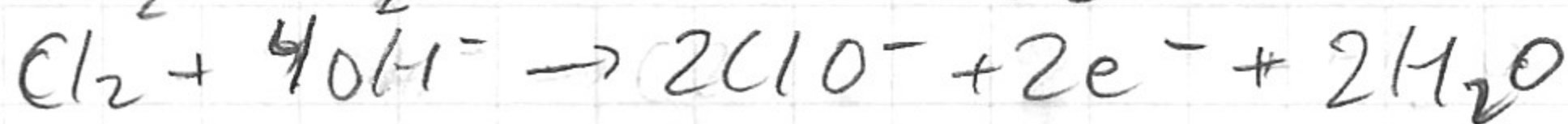
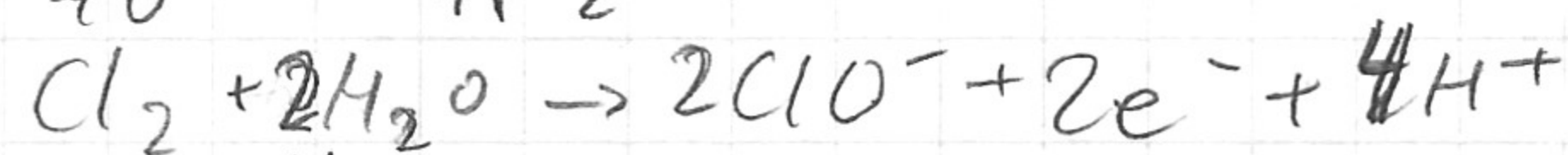
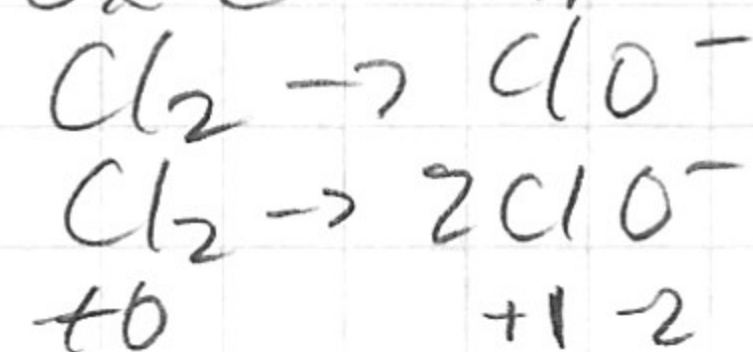




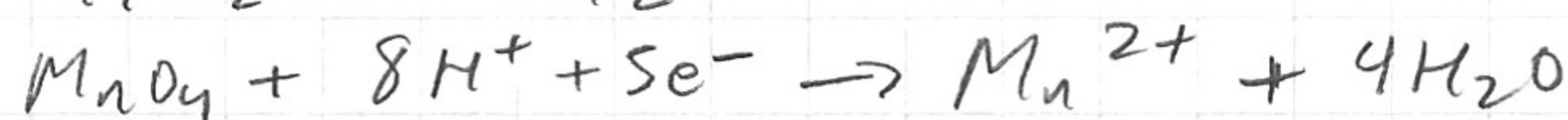
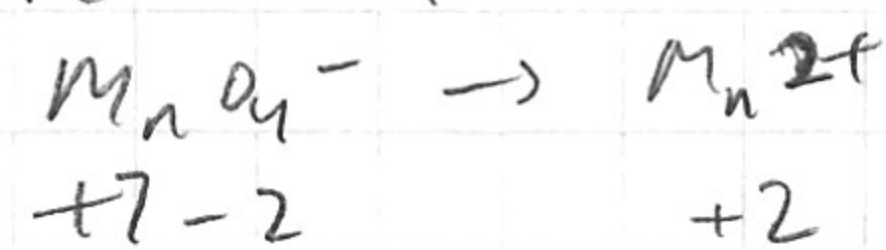
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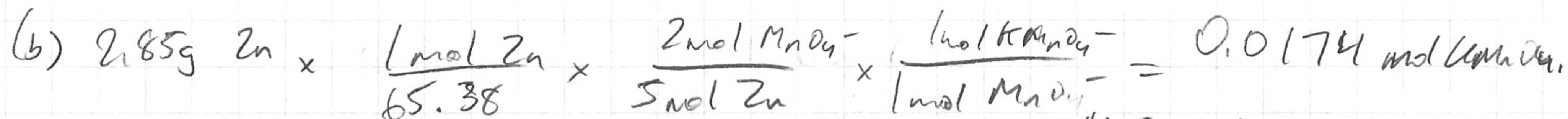
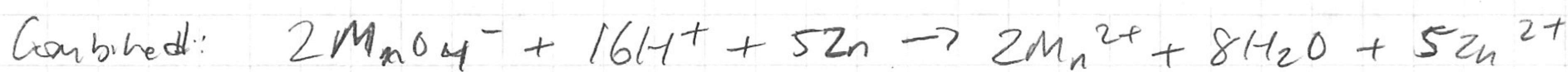
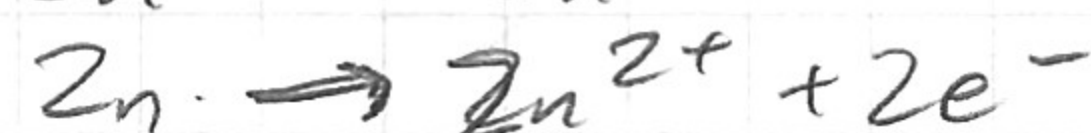
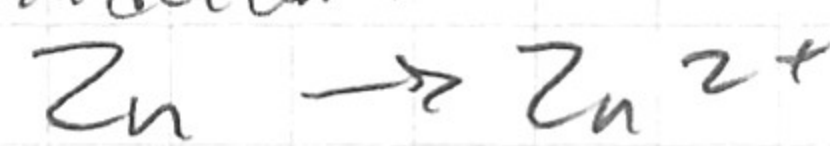
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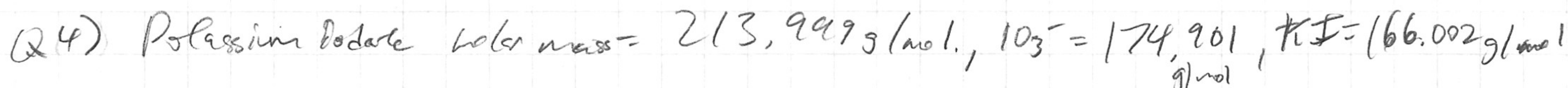
Reduction



Oxidation

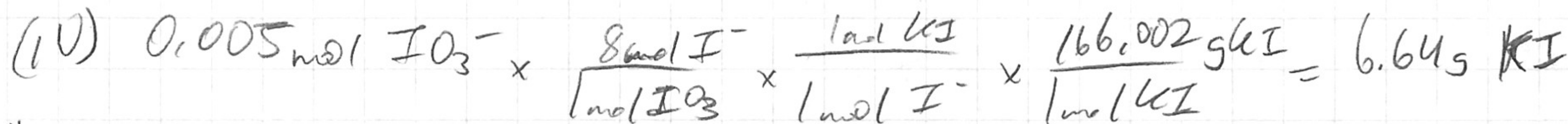
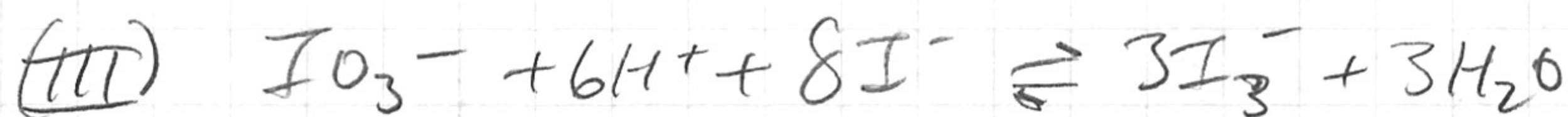


$$\text{Volume} = \frac{\text{mol}}{M} = \frac{0.0174}{0.500} = 0.0349\text{L} = 34.9\text{mL } 0.500\text{M KMnO}_4 \text{ Solution.}$$

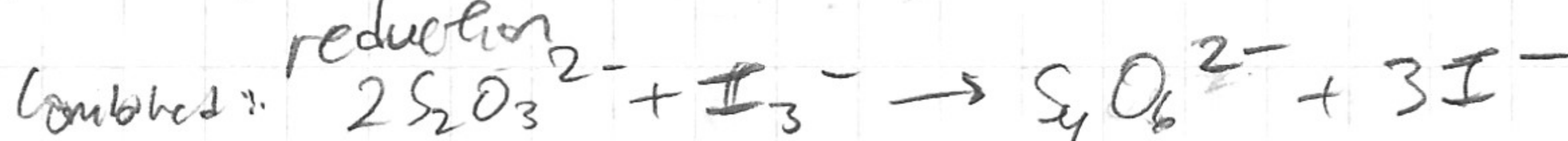
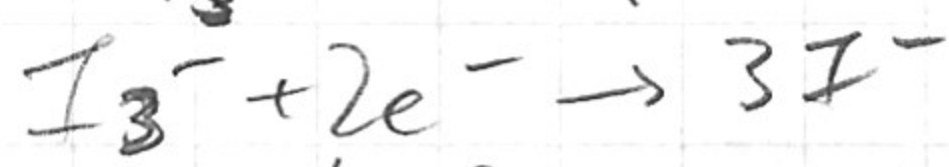
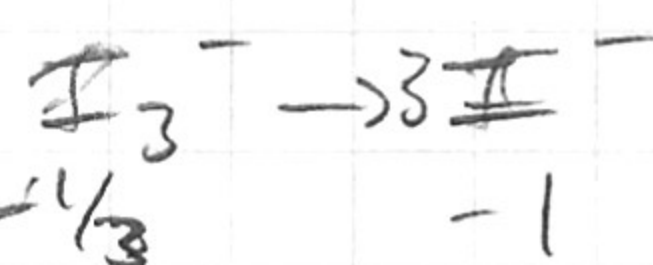
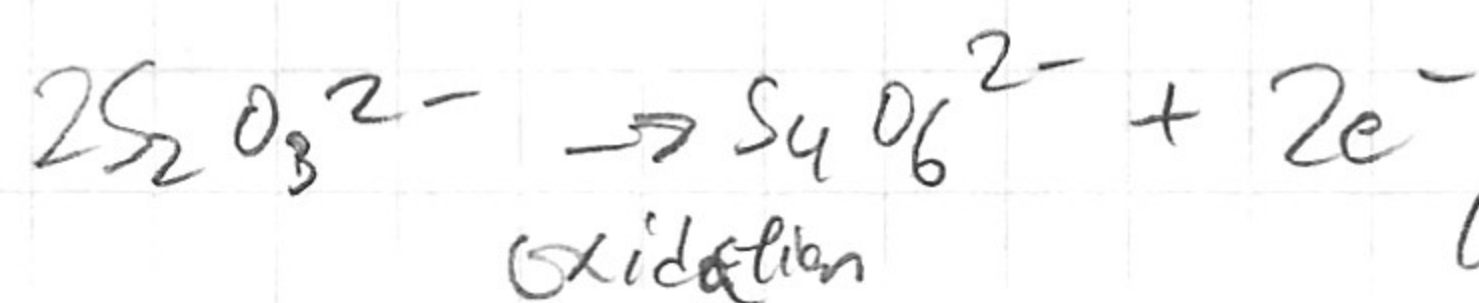
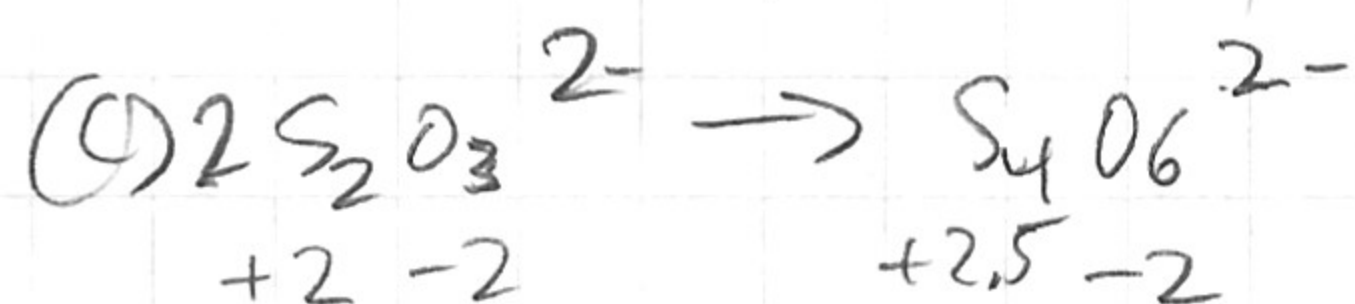
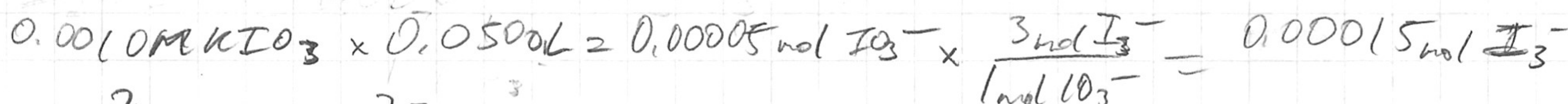
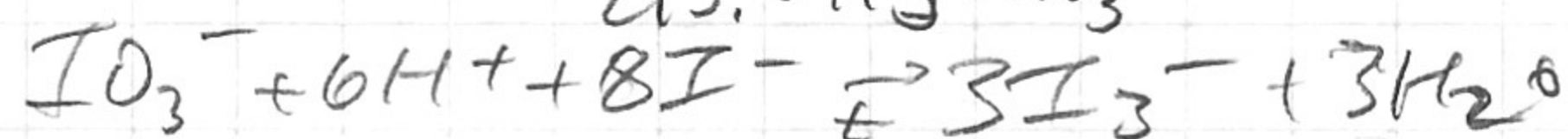
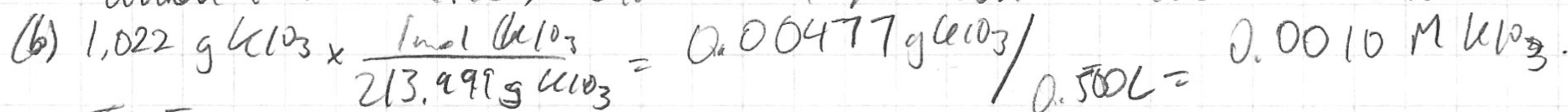


$$\text{mol} = M \cdot \text{volume} = 0.02 \times 0.02500 = 0.0005\text{mol KI} \times \frac{213.999\text{g}}{1\text{mol KI}} = 1.07\text{g}$$

$$(b) \text{mol} = 0.02 \times 0.02500 = 0.0005\text{mol KI} = 0.0005\text{mol IO}_3^- \times \frac{174.901\text{g}}{1\text{mol IO}_3^-} = 0.087\text{g IO}_3^-$$



Q5. (a) Because iodine, in the presence of excess iodide, forms the triiodide ion, which forms a redox equilibrium reaction for the basis of back-titration.



$$d) 0.00615 \text{ mol } I_3^- \times \frac{2 \text{ mol } S_2O_3^{2-}}{1 \text{ mol } I_3^-} = \frac{0.00030 \text{ mol } S_2O_3^{2-}}{0.03766} = 0.00797 \text{ M } Na_2S_2O_3$$

$$e) 0.00797 \text{ M} \times 0.01422 \text{ L} = 0.000113 \text{ mol } S_2O_3^{2-} \times \frac{1 \text{ mol } I_3^-}{2 \text{ mol } S_2O_3^{2-}} = 5.66 \times 10^{-5} \text{ mol } I_3^-$$

$$0.00015 - 5.66 \times 10^{-5} = 0.0000934 \text{ mol } I_3^- \text{ consumed by ascorbic acid}$$

$$9.34 \times 10^{-5} \text{ mol } I_3^- \times \frac{1 \text{ mol } I_2O_5}{3 \text{ mol } I_3^-} \times \frac{3 \text{ mol WtC}}{1 \text{ mol } I_2O_5} \times \frac{176.13 \text{ g}}{1 \text{ mol WtC}} = \frac{0.6164 \text{ g WtC}}{1.2235} = 1.34\%$$

$$Q6. 0.0500 \text{ L} \times 0.1186 \text{ M } Ce^{4+} = 0.00593 \text{ mol } Ce^{4+} \text{ ascorbic acid.}$$

$$0.03113 \text{ L} \times 0.04289 \text{ M } Fe^{2+} \times \frac{1 \text{ mol } Ce^{4+}}{1 \text{ mol } Fe^{2+}} = 0.001335 \text{ mol } Ce^{4+} \text{ unused.}$$

$$0.00593 - 0.001335 = 0.00459 \text{ mol } Ce^{4+} \text{ used} \times \frac{1 \text{ mol } NO_2^-}{2 \text{ mol } Ce^{4+}} = 0.00230 \text{ mol } NO_2^-$$

$$\frac{0.00230 \text{ mol } NO_2^-}{0.02500} = 0.0919 \text{ M } NO_2^- \times 0.500 \text{ L} = 0.459 \text{ mol } NO_2^- \times \frac{68.99 \text{ g } NaNO_2}{1 \text{ mol } NO_2^-} = 3.17 \text{ g } NaNO_2$$

$$4.030 \text{ g sample}$$

$$78.6\% NaNO_2$$