

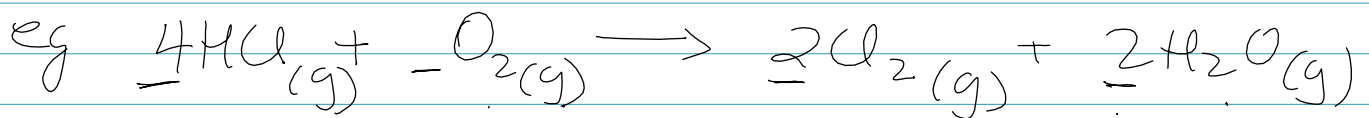
Sapna Sultana

## Thermodynamics 3 - Calculating Entropy ( $\Delta S^\circ$ ).

$$\Delta S^\circ = \sum n_p S^\circ(\text{products}) - \sum n_r S^\circ(\text{reactants})$$

↑  
at STP

products                      reactants.



value of  $\Delta S$  should  
-ve

$$\Delta S^\circ = \sum \Delta S^\circ_{\text{product}} - \sum \Delta S^\circ_{\text{reactants}}$$

$$\begin{aligned} & \left[ 2\text{Cl}_2 + 2\text{H}_2\text{O} \right]_{\text{product}} - \left[ 4\text{HCl} + \text{O}_2 \right]_{\text{react}} \\ & \left[ (2 \times 223) + (2 \times 188.7) \right] - \left[ (4 \times 186.8) + (1 \times 205) \right] \\ & = \boxed{-128.8 \text{ J/K}} \end{aligned}$$