**Entropy Change of Surroundings**



∆Ssys only tells us some of the story. We must also consider how the entropy change of the surroundings changes.

For example, if a reaction is exothermic, the temperature of the surroundings will increase and so the entropy of the surroundings will increase.

We calculate ∆Ssurr using the following equation



∆Ssurr = -∆H

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E.g. Calculate ∆Ssurr for the following reaction at 298K

N2(g) + 3H2(g) 🡪 2NH3(g) ∆H = -92 kJmol-1



E.g. Calculate ∆Ssurr for the following reaction at 298K

C2H2(g) + 2H2(g) 🡪 C2H6(g) ∆H = -296 kJmol-1



**Total entropy change** ∆Stotal

This is calculated using the equation

∆Stotal = ∆Ssys + ∆Ssurr

E.g. Calculate ∆Stotal for the reaction below

N2(g) + 3H2(g) 🡪 2NH3(g) (∆Ssys = -198.8 J K-1 mol-1)



**∆Stotal and reaction feasibility**

If ∆Stotal is positive the reaction is feasible.



If ∆Stotal is negative, the reaction is not feasible.

A feasible reaction is one that will continue to occur without needing to be forced or pushed.