Midterm

Homework

1. $CH_3OH_{(\ell)} + \frac{3}{2}O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(g)}$

$$\Delta H_r = \sum \Delta H_{r_P} - \sum \Delta H_{r_R}$$

$$= \left[(1\,mol)(-393.5\,kJ/mol) + (2\,mol)(-241.8\,kJ/mol)\right] - \left[(1\,mol)(-239.1\,kJ/mol) + \left(\tfrac{3}{2}\,mol\right)(0\,kJ/mol)\right]$$

$$= (-877.1\,kJ) - (-239.1\,kJ)$$

$$\underline{\Delta H_r = -638\,kJ}$$

$$\Delta H_r = nH_r$$

$$H_r = \frac{\Delta H_r}{n} = \frac{-638\,kJ}{1\,mol} = -638\,kJ/mol$$

Thermal Stability

Thermal Stability - the tendency of a compound to resist decomposition when heated.

- the more endothermic the simple decomposition (sd), the more stable the compound.

Ex. $H^o_{(sd)}$ = + 280.7 kJ/mol
SnO

$H^o_{(sd)}$ = + 577.6 kJ/mol
SnO_2

Therefore SnO_2 is more stable.

*Normally not given the H_{sd}, but given the H_f

+45.9 kJ/mol +125.6 kJ/mol

Which is more stable, ammonia or butane?

Worksheet