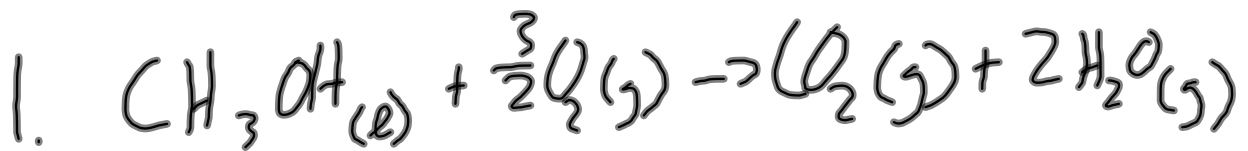


# Midterm

## Homework



$$\Delta H_r = \sum \Delta H_{r,p} - \sum \Delta H_{r,r}$$

$$= \left[ (1 \text{ mol}) (-393.5 \text{ kJ/mol}) + (2 \text{ mol}) (-241.8 \text{ kJ/mol}) \right]$$

$$- \left[ (1 \text{ mol}) (-239.1 \text{ kJ/mol}) + \left(\frac{3}{2} \text{ mol}\right) (0 \text{ kJ/mol}) \right]$$

$$= (-877.1 \text{ kJ}) - (-239.1 \text{ kJ})$$

$$\Delta H_r = -638 \text{ kJ}$$

$$\Delta H_r = nH_r$$

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

# 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.

$$\text{Ex. } H^{\circ}_{(\text{sd})} = + 280.7 \text{ kJ/mol} \\ \text{SnO}$$

$$H^{\circ}_{(\text{sd})} = + 577.6 \text{ kJ/mol} \\ \text{SnO}_2$$

**Therefore SnO<sub>2</sub> is more stable.**

\*Normally not given the  $H_{\text{sd}}$ , but given the  $H_{\text{f}}$

$$+45.9 \text{ kJ/mol} \quad +125.6 \text{ kJ/mol}$$

Which is more stable, ammonia or butane?

# Worksheet