

1. A 295g Aluminum engine part at an initial temperature of 3.0 °C absorbs 85.0 kJ of heat. What is the final temperature of the part in °C? (3 pts)

$$S_{\text{Al}} = 0.900 \text{ J/g } ^\circ\text{C}$$

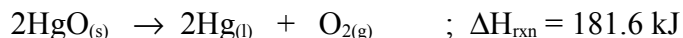
$$Q = m \times S \times \Delta T$$

$$85.0 \times 10^3 \text{ J} = 295 \text{ g} \times 0.900 \text{ J/gK} \times (T_f - 3.0 \text{ } ^\circ\text{C})$$

Solve for T_f

$$T_f = 323 \text{ } ^\circ\text{C}$$

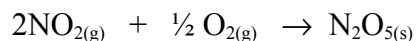
2. A mercury mirror forms inside a test tube by the thermal decomposition of mercury (II) oxide. How much heat is needed to decompose 555g of the oxide? (3 pts)



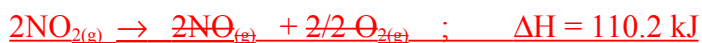
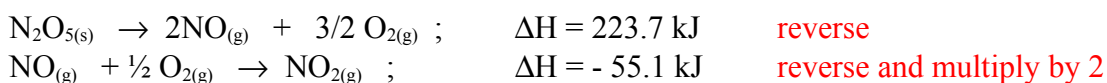
$$M_w \text{ of HgO} = 217 \text{ g/mol}$$

$$555 \text{ g HgO} \times \frac{\text{mol}}{217\text{g}} \times \frac{181.6 \text{ kJ}}{\text{HgO}} = 232 \text{ KJ}$$

3. Given the following information, calculate ΔH for the overall equation: (4 pts)



Use Hess's Law



$$\Delta H = - 113.5 \text{ kJ}$$