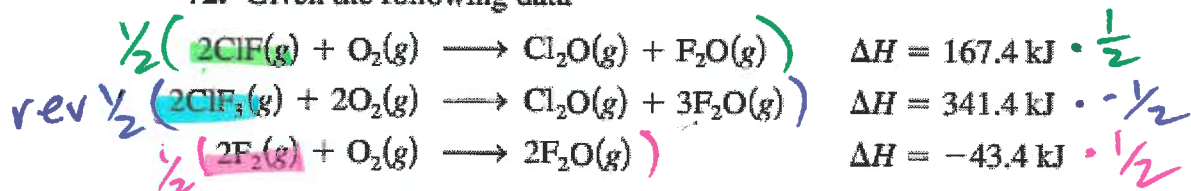
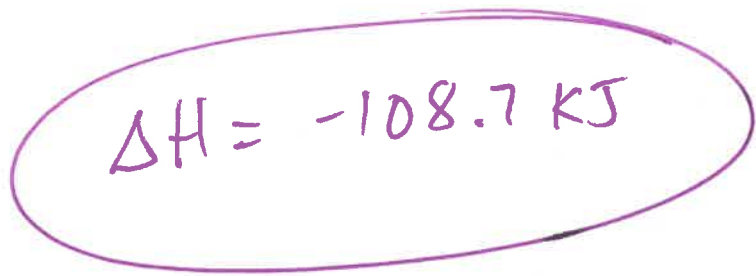
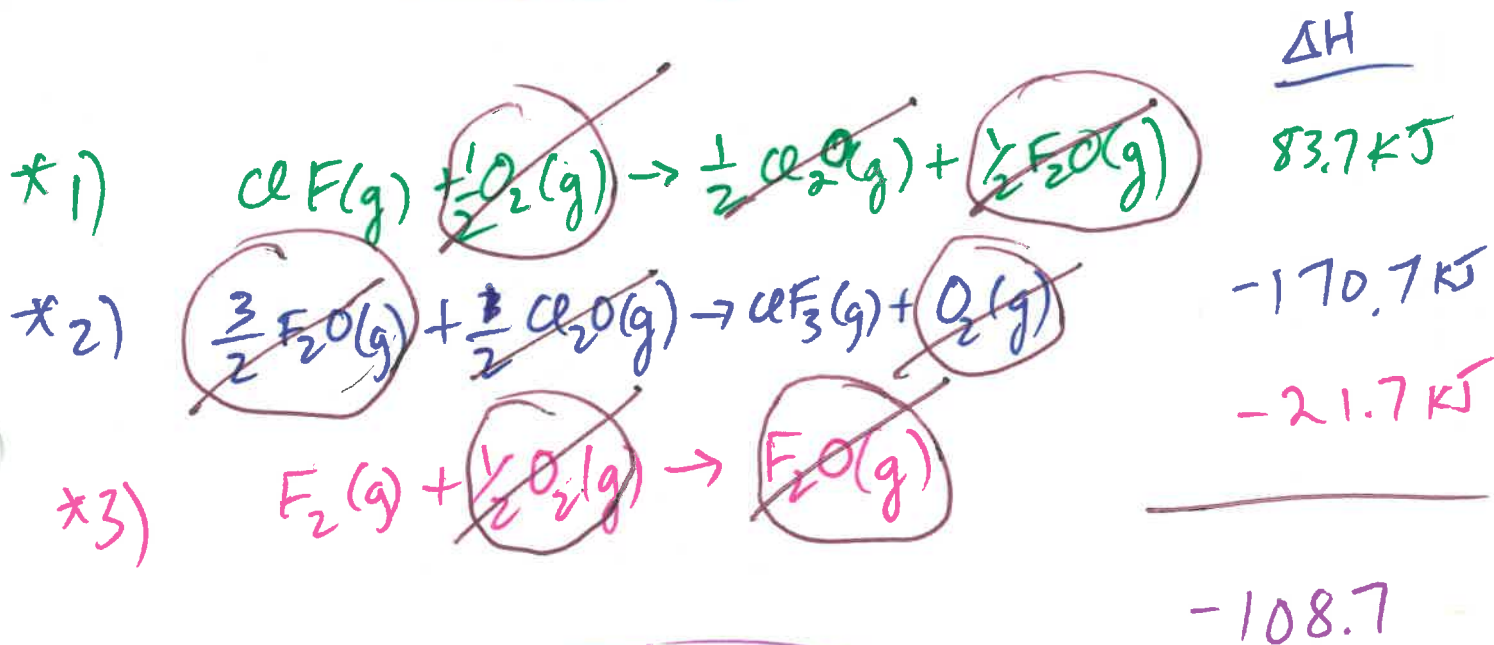


Chapter 6 - Hess' Law Examples from Zumdahl 9th Ed

72. Given the following data



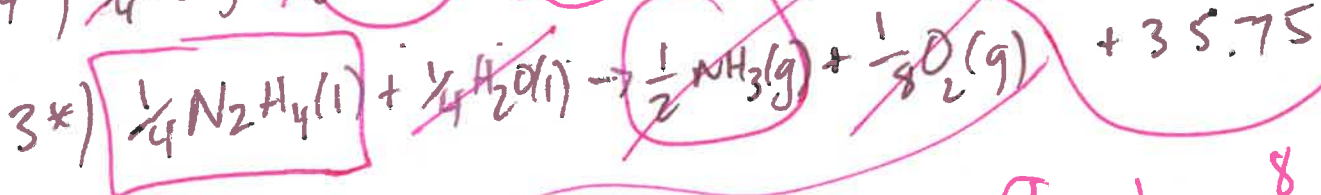
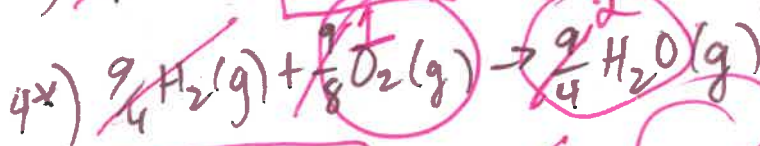
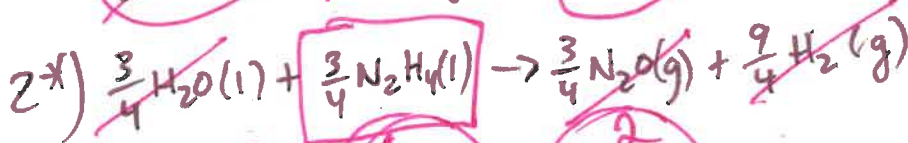
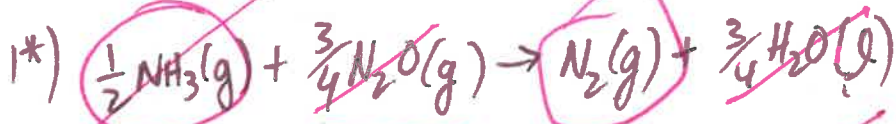
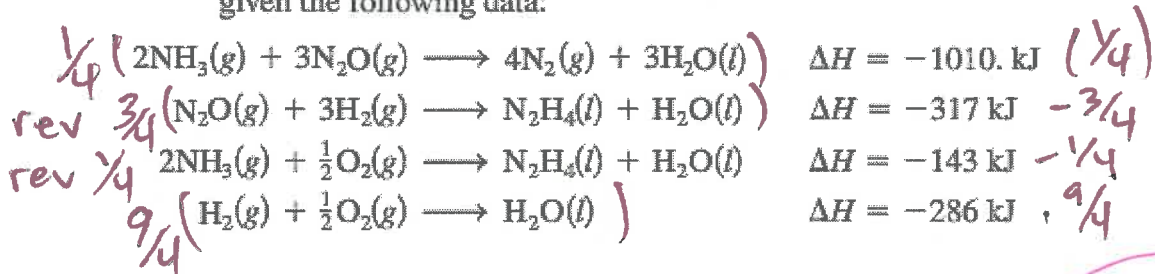
calculate ΔH for the reaction



74. Calculate ΔH for the reaction



given the following data:



-252.5 kJ

+237.75 kJ

-643.5

+35.75

$$\frac{9}{4} - \frac{1}{4} = \frac{8}{4} = 2$$

$\Delta H = 623 \text{ kJ}$

80. Calculate ΔH for the reaction:



given the following data:

- 1) **Keep** $2\text{NH}_3(\text{g}) + 3\text{N}_2\text{O}(\text{g}) \longrightarrow 4\text{N}_2(\text{g}) + 3\text{H}_2\text{O}(\text{l})$
 $\Delta H = -1010. \text{ kJ}$
- 2) **rev** $3(\text{N}_2\text{O}(\text{g}) + 3\text{H}_2(\text{g}) \longrightarrow \text{N}_2\text{H}_4(\text{l}) + \text{H}_2\text{O}(\text{l}))$
 $\Delta H = -317 \text{ kJ} \cdot (-3) = +951$
- 3) **rev** $4(\text{N}_2\text{H}_4(\text{l}) + \text{O}_2(\text{g}) \longrightarrow \text{N}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l}))$
 $\Delta H = -623 \text{ kJ} \cdot (-4) = +2492$
- 4) $9(\text{H}_2(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \longrightarrow \text{H}_2\text{O}(\text{l}))$
 $\Delta H = -286 \text{ kJ} \cdot (9) = -2574$

- 1) $2\text{NH}_3(\text{g}) + 3\text{N}_2\text{O}(\text{g}) \leftrightarrow 4\text{N}_2(\text{g}) + 3\text{H}_2\text{O}(\text{l})$
- 2*) $3\text{N}_2\text{H}_4(\text{l}) + 3\text{H}_2\text{O}(\text{l}) \rightarrow 3\text{N}_2\text{O}(\text{g}) + 9\text{H}_2(\text{g})$
- 3*) $4\text{N}_2(\text{g}) + 8\text{H}_2\text{O}(\text{l}) \rightarrow 4\text{N}_2\text{H}_4(\text{l}) + \frac{9}{2}\text{O}_2(\text{g})$
- 4*) $9\text{H}_2(\text{g}) + \frac{9}{2}\text{O}_2(\text{g}) \rightarrow 9\text{H}_2\text{O}(\text{l})$

$$\Delta H = -141 \text{ kJ}$$