

Let's first convert grams of water to moles of water (molar mass of water is 18 g/mol):

$$1255 \text{ g } H_2O \cdot \left(\frac{1 \text{ mol}}{18.0 \text{ g}} \right) = 69.7 \text{ mol } H_2O.$$

The amount of heat released when 1 mol of vapor condenses is called a molar heat of condensation (ΔH_{cond}):

$$\Delta H_{vap} = -\Delta H_{cond}.$$

The molar heat of vaporization of water is $\Delta H_{vap} = 40.7 \text{ kJ/mol}$.

Then, $\Delta H_{cond} = -40.7 \text{ kJ/mol}$ and the next step is a conversion from moles of water to ΔH , multiplying by the ΔH_{cond} :

$$\Delta H = 69.7 \text{ mol } H_2O \cdot \frac{-40.7 \text{ kJ}}{1 \text{ mol } H_2O} = -2837 \text{ kJ}.$$

The negative sign indicate that heat is given off.

Therefore, the process will release **2837kJ** of heat.