Answer on Question #43528 - Chemistry - Inorganic Chemistry

Question:

The enthalpy of fusion for H_2O is 6.0 kJ·mol^{-1}. How many grams (to 1 decimal place) of ice can be converted to liquid water at 0°C using 43 kJ of energy?

Solution:

Number of moles of ice, which can be converted to liquid water at 0°C using 43 kJ:

$$n = \frac{Q}{\Delta H^o_{fus}} = \frac{43\ kJ}{6.0\,\frac{kJ}{mol}} = 7.2\ mol$$

Mass of 7.2 mol of ice:

$$m = n \cdot M_{H_2O} = 7.2\ mol \cdot 18.0\,\frac{g}{mol} = 129.6\ g,$$

where M_{H_2O} - molar mass of water.

Answer: 129.6 g