Heating Curve

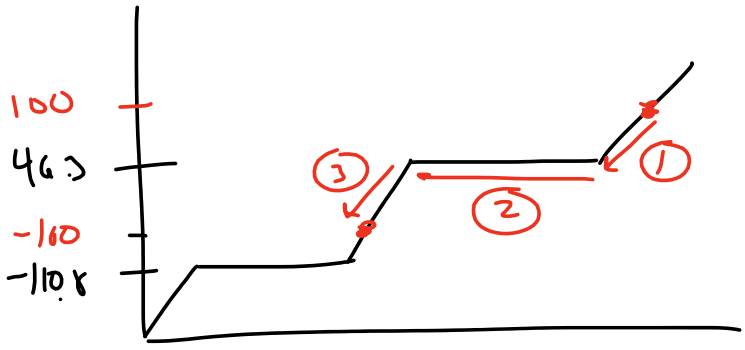
Monday, April 17, 2017 7:19 AM

CHEM 105 Bonus Quiz

Name _____

1. Use the following information to determine ΔH when 50 grams of CS_2 is cooled from 100 °C to -100 °C.

T_m (°C)	T_b (°C)	ΔH_{fusion} (kJ/mol)	$\Delta H_{vaporization}$ (kJ/mol)	C (solid) J / (mol K)	C (liquid) J / (mol K)	C (gas) J / (mol K)
-110.8	46.3	4.39	27.65	54.02	78.99	46.55



① $\Delta H = \frac{46.55\ J}{mol \cdot K}(46.3 - 100) = -2499.7\ \frac{J}{mol}$

$-2499.7\ \frac{J}{mol}\left(\frac{1\ kJ}{10^3\ J}\right) = -2.4997\ \frac{kJ}{mol}$

② $\Delta H = -27.65\ \frac{kJ}{mol}$

③ $\Delta H = \frac{78.99\ J}{mol\ K}(-100 - 46.3) = -11{,}556\ \frac{J}{mol}$

$$-11{,}556\ \text{J} \left| \frac{1\ \text{KJ}}{10^3\ \text{J}} \right| \frac{}{\text{mol}} = -11.556\ \frac{\text{KJ}}{\text{mol}}$$

$$\Delta H = (1) + (2) + (3) = -41.71\ \frac{\text{KJ}}{\text{mol}}$$

$$50\ \text{g} \left| \frac{\text{mol}}{76.15\ \text{g}} \right. = 0.657\ \text{mol}$$

$$0.657\ \text{mol} \left| \frac{-41.71\ \text{KJ}}{\text{mol}} \right. = -27.39\ \text{KJ}$$