ACETIC ACID CH_3COOH FREEZES AT 16.6°C

PREDICT THE SIGN OF ΔH, ΔS, and ΔG AT THE TEMPERATURE INDICATED

a) CH_3COOH melts at −20°C ΔH + ΔS + ΔG +

b) CH_3COOH melts at 16.6°C ΔH + ΔS + ΔG 0

c) CH_3COOH melts at 80°C ΔH + ΔS + ΔG −

The ΔH_{fus} for acetic acid is 4.144 kJ/mol. What is ΔS when 1.00 mole of liquid acetic acid freezes at its melting point?

$$0 = \Delta H - T\Delta S \Rightarrow T = \frac{\Delta H}{\Delta S}$$

$$\Delta S = \frac{\Delta H}{T} = \frac{-4.144\ \text{kJ/mol}}{289.6\ \text{K}}$$

$$\Delta S = -14.31\ \text{J/mol·K}$$

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