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Physical chemistry - II

T°C fusion T=0 to T=T_f

ΔH_f = molar latent heat of fusion.

Absolute entropy of gases and liquids:

$$\Delta S_1 = \int_0^T (C_p)_s \cdot \frac{dT}{T} \quad \text{—①}$$

$$\Delta S_2 = \frac{\Delta H_f}{T_f} \quad \text{—②}$$

$$\Delta S_3 = \int_{T_f}^{T_b} C_{P(l)} \cdot \frac{dT}{T} \quad \text{—③}$$

$$\Delta S_4 = \frac{\Delta H_v}{T_b} \quad \text{—④}$$

$$\Delta S_5 = \int_{T_b}^{T} C_{P(g)} \cdot \frac{dT}{T} \quad \text{—⑤}$$

$$S_T = \Delta S_1 + \Delta S_2 + \Delta S_3 + \Delta S_4 + \Delta S_5 \quad \text{—⑥}$$

$$S_T = \int_0^{T_f} C_{P(s)} \cdot \frac{dT}{T} + \frac{\Delta H_f}{T_f} + \int_{T_f}^{T} C_{P(l)} \frac{dT}{T} + \frac{\Delta H_v}{T_b} + \int_{T_b}^{T} C_{P(g)} \frac{dT}{T} \quad \text{—⑦}$$

$$S_T = \Delta S_1 + \Delta S_2 + \Delta S_3 \quad \text{—⑧}$$

$$S_T = \int_0^{T_f} C_{P(s)} \frac{dT}{T} + \frac{\Delta H_f}{T_f} + \int_{T_f}^{T} C_{P(l)} \frac{dT}{T} \quad \text{—⑨}$$

$$S_T = \int_0^{T} C_{P(s)} \cdot \frac{dT}{T} \quad \text{—⑩}$$