Exercise 6-3

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$$dS = \frac{dQ}{T} = \frac{C_v n dT}{T} = 1.00 \times 10^6 n \frac{T^2}{\theta^3} dT$$

$$n = \frac{m}{M_w} = \frac{1g}{12 g\,mol^{-1}} = \frac{1}{12} mol = \frac{1}{12000} kmol$$

$$\Delta S = \frac{1.00 \times 10^6}{12000 \times 223^3} \cdot \int_4^{300} T^2 dT$$

$$= \frac{1.00 \times 10^3}{12 \times 223^3} \cdot \frac{1}{3}\left(300^3 - 4^3\right)$$

$$= 0.127\ J K^{-1}$$