

# Entropy

Thermodynamics

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The Sackur-Tetrode equation is:

$$S = kN \left[ \ln \left( \frac{V}{N} \left( \frac{4\pi mU}{3Nh^2} \right)^{\frac{3}{2}} \right) + \frac{5}{2} \right]. \quad (1)$$

1. What is the entropy of a mole of argon at room temperature and one atmosphere of pressure? Hints:
  - Use the ideal gas law to determine the volume per molecule,  $V/N$ .
  - Use the equipartition theorem to determine the energy per molecule,  $U/N$ .