

33. We substitute  $d = 1.0 \times 10^{-2} \text{ m}$  and  $N/V = 15/(1.0 \times 10^{-3} \text{ m}^3) = 15 \times 10^3 \text{ beans/m}^3$  into Eq. 20–25

$$\lambda = \frac{1}{\sqrt{2}\pi d^2 N/V}$$

to obtain

$$\lambda = \frac{1}{\sqrt{2}\pi (1.0 \times 10^{-2} \text{ m})^2 (15 \times 10^3 / \text{m}^3)} = 0.15 \text{ m} .$$

The conversion  $1.00 \text{ L} = 1.00 \times 10^{-3} \text{ m}^3$  is used.