

72. A molecule with speed v_{avg} will (typically) suffer a collision after a time $t = \lambda/v_{\text{avg}}$ by definition of the mean free path λ . Thus, we think of $1/t$ as the collision frequency f and use Eq. 20-25.

$$f = \frac{v_{\text{avg}}}{\lambda} = \frac{v_{\text{avg}}}{\frac{1}{\pi\sqrt{2}d^2N/V}} = \pi\sqrt{2}d^2v_{\text{avg}}\left(\frac{N}{V}\right) .$$