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mean free path, λ

The average distance a molecule travels between collisions. For a molecule, $\lambda = (\sqrt{2}\ \pi\ n\ d_{\mathrm{m}}{}^{2})^{-1}$, where n is the number of molecules per unit volume and d_{m} is their mean diameter. For O_2 at one atmosphere and 25 °C, this distance is only 9.7×10^{-6} cm; at 10^{-6} atmospheres and 25 °C it is 9.7 cm. For an aerosol particle, the mean free path, λ_{B} in the Stokes region (see Stokes law) is given by: $\lambda_{\mathrm{B}} = \sqrt{\frac{3\,k\,T}{m}}\ m\,B$ where m is the mass of the particle, k is the Boltzmann constant (1.381×10^{-23} J K^{-1}), T is the temperature (K) and B is the mobility.

Source:
PAC, 1990, *62*, 2167 *(Glossary of atmospheric chemistry terms (Recommendations 1990))* on page 2201
Green Book, 2nd ed., p. 56

