

**Instructor's guide** This activity follows Temperature of the Earth.

Estimate the optical depth for infrared light with wavelength  $15 \mu\text{m}$  when it travels through our atmosphere at standard temperature and pressure *STP*. The number density of air molecules at STP can be found from  $pV = Nk_B T$ .

Our air is 0.041% CO<sub>2</sub> (410 ppm).

Missing /var/www/paradigms\_media\_2/media/activity\_media/molecular-absorption-cross-sections.png

Figure 1: Absorption cross sections  $\sigma_a$ . The graph is from *Fundamentals of Atmospheric Radiation* by Craig Bohren, a highly recommended book.