Calculation

The total weight of brake linings in use is

$$\frac{100,000,000 \times 4}{2000} = 200,000 \text{ Tons.}$$

The quantity worn off these linings per year follows from the assumptions made in c.

$$\text{as } 200,000 \times \frac{1}{3} \times \frac{50}{100} = \frac{200,000}{6} \text{ Tons/yr.}$$

This wear dust contains 1% asbestos, hence emission is

$$\frac{200,000}{6} \times \frac{1}{100} = \frac{2000}{6} \text{ Tons/yr.}$$

Allowing for the fact that 20% is not emitted, the total emission is thus

$$\frac{2000}{6} \times \frac{80}{100} = \frac{1600}{6} = 270 \text{ Tons/yr.}$$

Effect on the Atmosphere

There are no facts relating directly to asbestos on which one may judge the effect of these emissions on urban air. However, there has been a considerable amount of study done on the diffusion of other materials from automobiles, particularly lead and carbon monoxide. At a recent ACS Symposium in Minneapolis[6] evidence was presented which placed the level for lead emission at 0.01 $\mu g/m^3$ in Thule, Alaska and 2.5 $\mu g/m^3$ in New York City. Next to busy highways a level in excess of 50 $\mu g/m^3$ may well be possible. In the light of this data the value of 2 $\mu g/m^3$ for average urban air conditions, suggested by GM[4], seems eminently reasonable. Considering that 1.25×10^5 tons of lead are emitted in total from automobiles then the following factor is used.

$$\begin{array}{l}\text{Avg. Conc. asbestos} \\ \text{in city air from} \\ \text{automobiles}\end{array} \simeq \begin{array}{l}\text{Quantity of} \\ \text{asbestos} \\ \text{emitted}\end{array} \times \frac{2 \ \mu g/m^3 \text{ city air}}{1.25 \times 10^5 \text{ tons Pb from cars}}$$

Applying this figure to the present case and assuming that 200 tons are emitted in city areas, then we get that: