

Conversion between $\mu\text{g}/\text{m}^3$ and ppb

Concentrations of gaseous pollutants is sometimes given in units of mass per volume, and at other times in ppb or ppm.

ppb (v) is parts per billion by volume (i.e., volume of gaseous pollutant per 10^9 volumes of ambient air).

$\mu\text{g}/\text{m}^3$ is micrograms of gaseous pollutant per cubic meter of ambient air.

Conversion factors are listed in the table below for a number of substances.

The conversion assumes an ambient pressure of 1 atmosphere and a temperature of 25 degrees Celsius.

SO ₂	1 ppb = 2.62 $\mu\text{g}/\text{m}^3$
NO ₂	1 ppb = 1.88 $\mu\text{g}/\text{m}^3$
NO	1 ppb = 1.25 $\mu\text{g}/\text{m}^3$
O ₃	1 ppb = 2.00 $\mu\text{g}/\text{m}^3$
CO	1 ppb = 1.145 $\mu\text{g}/\text{m}^3$
Benzene	1 ppb = 3.19 $\mu\text{g}/\text{m}^3$

The general equation is

$$\mu\text{g}/\text{m}^3 = (\text{ppb}) \cdot (12.187) \cdot (M) / (273.15 + ^\circ\text{C})$$

where M is the molecular weight of the gaseous pollutant. An atmospheric pressure of 1 atmosphere is assumed.