

## Converting ppm to gm/m<sup>3</sup>

This question has come up over and over again in the years I've been dealing with CAMEO. Screening and Scenarios data used in CAMEO are expressed in grams per cubic meter (gm/m<sup>3</sup>) but other values, such as the IDLH level, are expressed in parts per million (ppm). This piece first appeared in my column in the May/June issue of the **CAMEO Today** newsletter in 1997. I've updated it slightly to with newer contact information for ACGIH®.

The following conversion formulae from the ACGIH® publication "Threshold Limit Values and Biological Exposure Indices for 1996" may be of use. They are presented for use in converting values for Threshold Limit Values (TLVs) but should be applicable in converting other values as well.

“Conversion of TLVs in ppm to mg/m<sup>3</sup>. TLVs for gases and vapors are usually established in terms of parts per million of substance in air by volume (ppm). For the convenience of the user, these TLVs are also listed here in terms of milligrams per cubic meter of air (mg/m<sup>3</sup>). The conversion is based on 760 torr [equivalent to 1 atmosphere] barometric pressure at 25°C (77°F), and where 24.45 = molar volume in liters, giving a conversion equation of: TVL in mg/m<sup>3</sup> = (TVL in ppm) (gram molecular weight of substance) (24.45).

“Conversely, the equation for converting TVLs in mg/m<sup>3</sup> to ppm is: TVL in ppm = (TVL in mg/m<sup>3</sup>) (24.45) (gram molecular weight of substance).

“**NOTE:** The above equation may be used to convert TVLs to any degree of precision desired. When converting TVLs to mg/m<sup>3</sup> units for other temperatures and pressures, the reference TVLs should be used as a starting point. When converting values expressed as an element (e.g. as Fe, as Ni), the molecular value of the element should be used, not that of the entire compound. “

**Source:** "Threshold Limit Values and Biological Exposure Indices for 1996," American Conference of Governmental Industrial Hygienists, 1996, page 9.

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