

Application Note DO-103

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Note About Henry's Constant

A special region of the distribution curve for stripped dissolved gases shows a straight line for dilute concentrations of gases. This is Henry's law which can be expressed as:

$$p = Hc/P_t \quad (1)$$

where

c = the mole fraction of gas in water

H = Henry's proportionality constant

P_t = total pressure atm

For concentration units measurement, a unitless Henry's law can be written:

$$p = H_u c \quad (2)$$

where p and c are concentration units (such as mg/L) for air and water respectively, and H_u is the unitless Henry's constant.

Henry's constant H_u for selected gases and vapors are:

at 20 deg C		at 25 deg C	
bromoform	.0261	acetone	.0015
carbon dioxide	.113	ethyl acetate	.005
chloroform	.127	toluene	.27
benzene	.18	ethyl benzene	.33
hydrogen sulfide	.384	cyclohexane	7.2
trichloroethylene	.41		10 @ 35 deg C
carbon tetrachloride	.963		
ozone	3.71		
methane	28.4		
Oxygen	32.1		

Henry's constant increases with temperature (see cyclohexane), and most gases have a ratio of about 2:1 over a "cold" to "hot" temperature range.

Henry's constant for many more gases are published in chemical reference manuals or see the Internet reference table:

R. Sander (1999) Compilation of Henry's Law Constants for Inorganic and Organic Species of Potential Importance in Environmental Chemistry (Version 3) <http://www.mpch-mainz.mpg.de/~sander/res/henry.html>