REFERENCE 1 FROM https://www.epa.gov/athens/learn2model/part-two/onsite/es.html



# EPA On-line Tools for Site Assessment Calculation

When chemicals are released into the environment from a mixture like a petroleum hydrocarbon fuel, the water solubilities of the chemicals are typically far lower than their published solubilities. For example, the solubility of benzene is around 1750 mg/L, but typical maximum benzene concentrations resulting from equilibrium between gasoline and water are only 20 - 40 mg/L. This occurs because the concentration (or effective solubility) depends on the abundance of the chemical in the fuel.

Experimental, temperature-dependent version of the calculator.

The effective solubility calculator only calculates the partitioning between water and a fuel. Use the mass distribution calculator to determine the partitioning (concentrations) between water, air, fuel and solids in the subsurface.

**Effective Solubility Calculator**

**Effective Solubility $C_w = x_o S$**

$C_w$ = Effective solubility
$x_o$ = mole fraction (of chemical in fuel)
S = solubility

**Mole Fraction $x_o = MF_x MW_o / MW_x$**

$MF_x$ = mass fraction of selected chemical in fuel
$MW_o$ = average molecular weight of fuel
est. 105 g/mole for gasoline
est. 165 g/mole for Jet fuel
est. 230 g/mole for diesel fuel
$MW_x$ = molecular weight of selected chemical

Example Data Set | Calculate | Clear
Save Data | Recall Data | Go Back

Site Name sample
Date 2/21/2012 Current Date
Chemical total xylenes
Solubility (S) 167. mg/L
Optional Revised Solubility (S) mg/L
*Example* Fuel 87 Octane gasoline (1) MTBE
Average Molecular Weight of 105.
Fuel ($MW_o$)
Percent Mass Fraction 4.77
Effective Solubility ($C_w$) 7.90 mg/L
Fuel composition note:
1996 Long Island OxyFuel (MTBE) Gasoline

Top ^
Home | Glossary | Notation | Links | References | Calculators

WCMS
Last updated on Tuesday, February 21, 2012

DEPOSITION EXHIBIT 10
PENGAD 800-631-6989