How to convert from PPM mol of Sulfur Compound to mg S/m^3

We will use the example of the 15.9 PPM mol DMS in Methane standard to show the work for this conversion.

1. The first thing to do is to convert to PPM wt. We do this by multiplying by the molecular weight of the component and then dividing by the molecular weight of the matrix. In the case of our example we use 62.13 g/mol as the molecular weight of DMS and 16.042 as the molecular weight of Methane.

(PPM mmol sulfur compound / Kmol Matrix) x (molecular weight sulfur compound in mg/ mmol = mg sulfur compound/ Kmol Matrix

Ex - (15.9 PPM mmol DMS/ Kmol Methane) x (62.13 mg DMS/ mmol DMS) = 987.9 mg DMS/ Kmol Methane

(mg sulfur compound/ Kmol Matrix) / (molecular weight of Matrix in Kg/ Kmol) = mg of sulfur compound / Kg of Matrix (mg/Kg =PPM weight)

Ex - (987.9 mg DMS/ Kmol Methane) / (16.047 Kg Methane/ Kmol Methane) = 61.56 mg DMS/ Kg Methane (This is PPM wt)

2. Next we convert to Sulfur from DMS (S). To do this we multiply by the molecular weight of Sulfur, 32.06 and divide by the molecular weight of DMS, 62.13.

((mg sulfur compound/Kg Matrix) x molecular weight of sulfur) / molecular weight of sulfur compound = mg S / Kg Matrix

Ex - ((61.56 mg DMS/ Kg Methane) x 32.06) / 62.13 = 31.77 mg S / Kg Methane

3. The last step is to change from the base of Kg to m^3. To accomplish this we multiply the result from above by the Ideal Gas Density for Methane, 0.67848 Kg Methane/ m^3. This value is from the SI version of the GPA 2145-03 method.

(mg S / Kg Matrix) x (Ideal gas density for Matrix Kg/ m^3) = mg S / m^3

Ex - (31.77 mg S / Kg Methane) x (0.67848 Kg Methane/ m^3 Methane) = 21.56 mg S / m^3 Methane

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