$$x_{NMHC} = x_{THC} - RF_{CH4} \cdot x_{CH4} - x_{NMHCinit} \qquad \text{Eq. 1065.660-3}$$

Example:

x_{THC} = 145.6 µmol/mol
RF_{CH4} = 0.970
x_{CH4} = 18.9 µmol/mol
$x_{NMHCinit}$ = 1.1 µmol/mol
x_{NMHC} = 145.6 − 0.970 · 18.9 − 1.1
x_{NMHC} = 126.2 µmol/mol

§ 1065.665 THCE and NMHCE determination.

(a) If you measured an oxygenated hydrocarbon's mass concentration (per mole of exhaust), first calculate its molar concentration by dividing its mass concentration by the effective molar mass of the oxygenated hydrocarbon, then multiply each oxygenated hydrocarbon's molar concentration by its respective number of carbon atoms per molecule. Add these C_1-equivalent molar concentrations to the molar concentration of NOTHC. The result is the molar concentration of THCE. Calculate THCE concentration using the following equations:

$$x_{THCE} = x_{NOTHC} + \sum_{i=1}^{N} x_{OHC_i} - x_{THCEinit} \qquad \text{Eq. 1065.665-1}$$

$$x_{NOTHC} = x_{THC} - \sum_{i=1}^{N} \left(x_{OHCi} \cdot RF_{OHCi} \cdot C^{\#} \right) \qquad \text{Eq. 1065.665-2}$$

$$x_{OHCi} = \frac{M_{exhOHCi} \cdot m_{dexhOHC}}{M_{OHCi} \cdot m_{dexh}} = \frac{n_{dexhOHC}}{n_{dexh}} \qquad \text{Eq. 1065.665-3}$$

Where:

x_{OHCi} = The C_1-equivalent concentration of oxygenated species *i* in diluted exhaust.
x_{THC} = The C_1-equivalent FID response to NOTHC and all OHC in diluted exhaust.
RF_{OHCi} = The response factor of the FID to species *i* relative to propane on a C_1-equivalent basis.
$C^{\#}$ = the mean number of carbon atoms in the particular compound.

(b) If we require you to determine NMHCE, use the following equation:

$$x_{NMHCE} = x_{THCE} - x_{CH4} \cdot RF_{CH4} \qquad \text{Eq. 1065.665-4}$$

(c) The following example shows how to determine NMHCE emissions based on ethanol (C_2H_5OH) and methanol (CH_3OH) molar concentrations, and acetaldehyde (C_2H_4O) and formaldehyde (HCHO) as mass concentrations:

x_{NMHC} = 127.3 µmol/mol
x_{C2H5OH} = 100.8 µmol/mol
x_{CH3OH} = 25.5 µmol/mol
$M_{exhC2H4O}$ = 0.841 mg/mol
$M_{exhHCHO}$ = 39.0 µg/mol
M_{C2H4O} = 44.05256 g/mol
M_{HCHO} = 30.02598 g/mol
x_{C2H4O} = 0.841/44.05256 1000
x_{C2H4O} = 19.1 µmol/mol
x_{HCHO} = 39/30.02598
x_{HCHO} = 1.3 µmol/mol
x_{NMHCE} = 127.3 + 2 100.8 + 25.5 + 2 19.1 + 1.3
x_{NMHCE} = 393.9 µmol/mol

§ 1065.667 Dilution air background emission correction.

(a) To determine the mass of background emissions to subtract from a diluted exhaust sample, first determine the total flow of dilution air, n_{dil}, over the test interval. This may be a measured quantity or a quantity calculated from the diluted exhaust flow and the