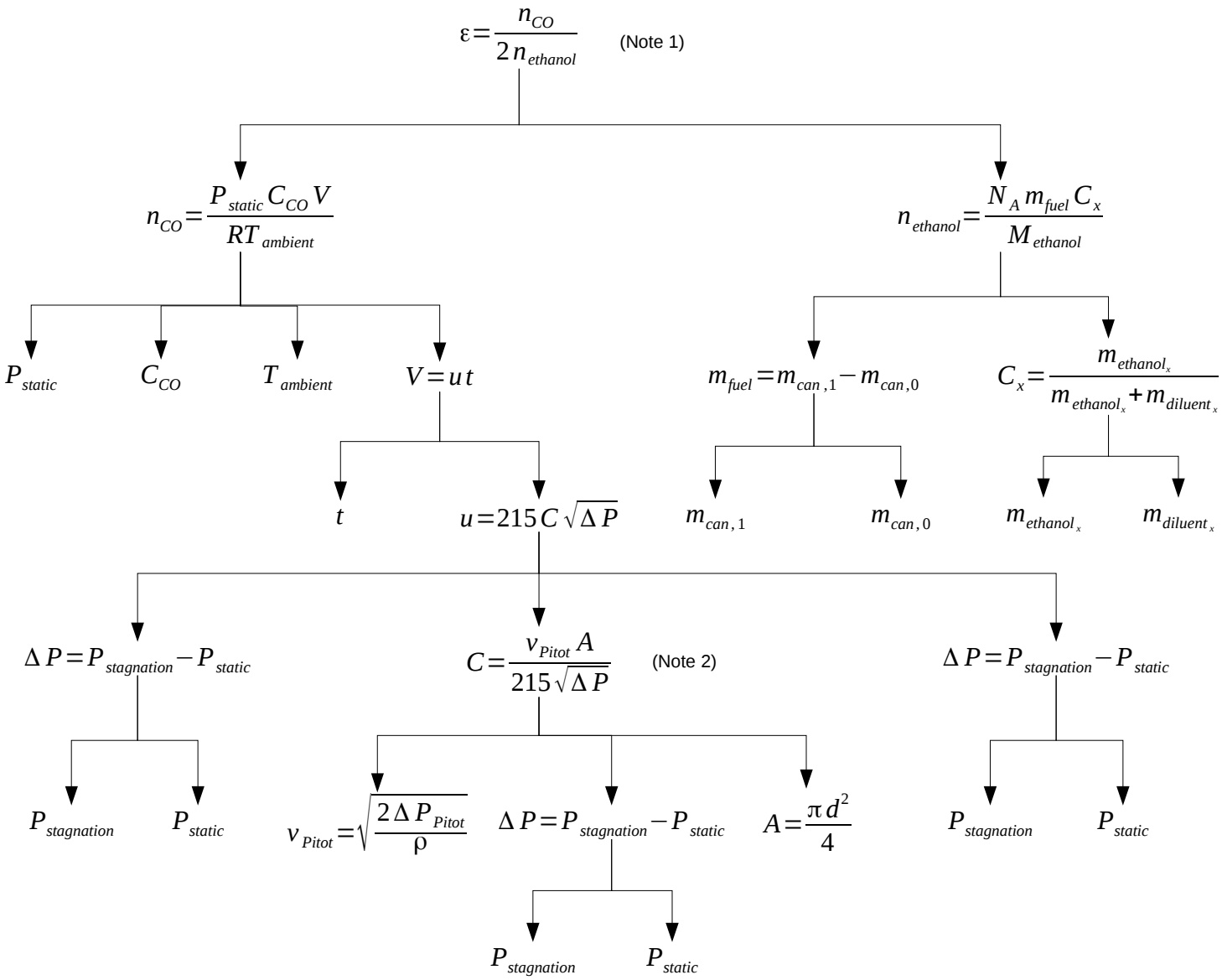
# CO Production Percentage (ε) Uncertainty Tree Diagram




Notes:
1) There are 2 carbon atoms in each ethanol molecule
2) The formula for volumetric flow rate through the sampling tube was provided from the manufacturer and is in units of cubic feet per minute and inches of water.

**Key:**

$n_{CO}$ = Number of molecules of CO released in test
$n_{ethanol}$ = Number of molecules of ethanol in test
$m_{fuel}$ = Mass of fuel in stove
$m_{can,0}$ = Dry mass of stove
$m_{can,1}$ = Mass of stove filled with fuel
$m_{ethanol\_x}$ = Mass of ethanol used to make mixture x
$m_{diluent\_x}$ = Mass of diluent (water) used to make mixture x
$M_{ethanol}$ = Molar mass of ethanol (46.06844 g/mol)
$N_A$ = Avogadro's number
$R$ = Universal gas constant
$C_x$ = Ethanol concentration of solution by mass
$C_{CO}$ = CO concentration of exhaust gas (ppm)
$T_{ambient}$ = Ambient temperature
$P_{static}$ = Ambient temperature
$P_{stagnation}$ = Ambient temperature
$\Delta P$ = Change in pressure across the sampling tube
$\Delta P_{Pitot}$ = Change in pressure across Pitot tube
$t$ = Total burn time
$V$ = Total volume of air passed through hood during test
C = calibration constant of sampling tube
d = Diameter of sampling tube
ρ = Density of ambient air
$u$ = Volumetric flow rate of air passed through hood during test