Req: Find the Volume of expelled gas & resultant Pressure for the assumed Pressure Vessel. After Thermally Burning Two (2) #18650 Cells

Given: – PV 6.0" (152mm) x 912mm Long

Vol = .0165449 $m^3$

– n Number of moles of Ideal Gas @ 20°C, 1 ATM

n = .688314 moles

– 2 Batt = (2)(2.54 l) @ STP = 5.08 l

.00508 $m^3$

Soln:

Number of moles of Gas generated

$$n = \frac{PV}{RT} = \frac{(101,325)(.00508\ m^3)}{(8.3144621)(273K)}$$

n = .226769 moles of gas

Equilibrium Temperature of mixed gas – (before Cooling)

$$T' = \frac{n_0 T_0 + n_1 T_1}{n_0 + n_1} = \frac{(.688314\ moles)(20°C) + (.226769\ moles)(733°)}{(.688314 + .226769)}$$

$T' = 196.7°C$

Find Pressure of Mixed Gases in PV @ T'

$$P = \frac{(n_0 + n_1)(R)(T')}{V_{PV}}$$

$$= \frac{[(.688314)+(.226769)](8.3144621)(196.7+273)}{.016549\ m^3}$$

$$P)_{Abs} = 215,945.\ Pa$$

$$215.945\ kPa \div 6.89476 = 31.32\ psia$$

$$- 14.6959$$

**16.6 psi gauge**