Results from 04/10/2014 Accumulation on the y2 module

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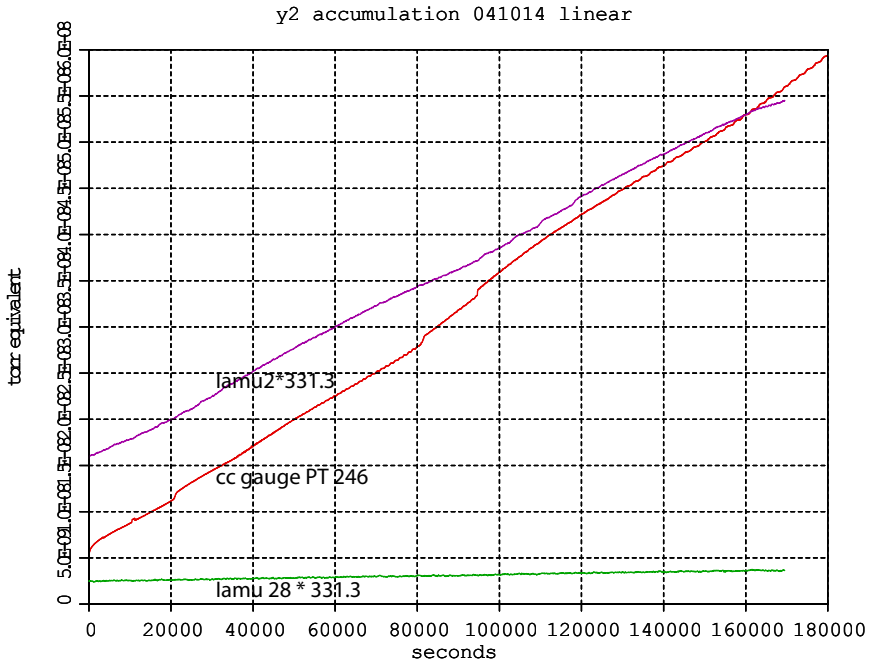

Figure 1 The accumulation data on a linear plot. The cold cathode gauge is the calibration for the accumulation. The amu 2 and amu 28 traces are the ion current multiplied by a first order estimate of the gauge constant for the RGA. The value adopted from the slope fitting programs is 386.4 torr/ampere for amu 28. The data used for the accumulation rate runs from 1.2 x 10^5 to 1.5 x 10^5 seconds. The RGA was not mounted directly on the large diameter tubes or vessel but rather through a corrugated tube estimated to be 6ft long with a 1 inch clear internal diameter. Even though the tube had been cleaned and baked, the tube had a significant effect on the measurement and it would be best not to use this type of connection again. The reason is that the RGA acts like an ion pump with approximately a 2 liter/sec pumping speed. The tube pumping speed for molecular hydrogen is 3.5 liters/sec while for molecular nitrogen it is 1 liter/sec. As a consequence the derivative of the pressure with time as measured at the RGA will be smaller than in the beamtube. The data needs to be corrected for this.

Table 1 Results of the accumulation at <T> = 21C

quantity	value	notes
$Q(H_2)$	1.37 x 10^{-6} torr liters/sec	
$Q(H_2)$ corrected for tube	2.17 x 10^{-6} torr liters/sec	
$J(H_2)$ @23C corrected for tube	3.9 x 10^{-14} torr liters/cm^2 sec	
$J(H_2)$ @23C in year 2000	4.8 x 10^{-14} torr liters/cm^2 sec	
$Q(N_2)$	1.8 x 10^{-8} torr liters/sec	
$Q(N_2)$ corrected for tube	5.5 x 10^{-8} torr liters/sec	
Q(air) corrected for tube	6.9 x 10^{-8} torr liters/sec	There is a leak into y2