

Subject: [E906] purity of deuterium
From: Paul E Reimer <reimer@ANL.GOV>
Date: 8/1/18, 15:28
To: <E906@LISTSERV.FNAL.GOV>

Hello,

I just received preliminary results from our deuterium samples. I sent 6 samples for analysis, three of which contained Fermilab deuterium (from two different bottles) and three contained Matheson deuterium. Of those samples, for some unknown reason, one of the Fermilab sample leaked completely, and two of the Matheson samples had 50% air contamination. Note that the Matheson samples were supposed to be 99.999% deuterium, where the analysis of the one which contained no air contamination had only 99.8%. (Perhaps this means that we have possible -0.19% uncertainty in the method?). The two Fermilab samples are consistent, and I propose that we use $95.8 \pm 0.2\%$ for all Fermilab deuterium runs.

I will put the full analysis write up in the docdb when I receive it.

Paul

Sample number	D2 Bottle number	Sample Date	runs	
1	Fermilab	53	4/12/18	95.6% D, 4.4% H; ca 92% D2 and 8% HD gases
2	Fermilab	113	4/12/18	96% D, 4% H; ca 93% D2 and 7% HD gases
3	Fermilab	53	4/12/18	just air, container must have leaked
4	Matheson	127	4/12/18	about half air, but did analyze remaining D2: 99.7% D, 0.3% H
5	Matheson	2	4/12/18	sample for test and setup purposes, not analyzed
6	Matheson		7/28/16	22308 more than half air, analyzed remaining D2: 99.3% D, 0.7% H
7	Matheson		5/28/17	27770 99.8% D, 0.2% H; 99.6% D2 and 0.4% HD

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