# Summary of DC & Calibration RUNs

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This note is the summary of recent DC & calibration runs, which were done on the IPB1 29b and 30b with He and IPB2-28b and SRI-IPB2 27b with H2. The Table 1 lists DC runs, showed in the Figure1. The Table 2 lists the comparison of DC & calibration runs showed in Figure 2. The Figure 3 plots He vs H2 at each temperature comparison of DC & calibrations.

Conclusions:

* Helium runs have higher HP drops than hydrogen in DC runs, which means there is more heater power needed to run hydrogen than helium.
* Hydrogen with Q pulse vs. DC runs have higher HP drops than helium with Q pulse vs DC in the calibration runs, which showed there are heat powers generated by the reaction.

Table 1. DC Runs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Date | 10/3/2016 | 10/12/2016 | 11/10/2016 | 8/29/2016 | 10/15/2016 | 10/26/2016 |
| Core | IPB1-29b | IPB1-29b | IPB1-30b | IPB2-28b | SRI-IPB2-27b | IPB1-29b |
| H2/He | He | He | He | H2 | H2 | H2 |
| Temp | **HPdrop/DCpower** | | | | | |
| 150 | ***0.49*** | ***0.49*** | ***0.50*** | 0.41 | ***0.41*** | ***0.45*** |
| 200 | ***0.53*** | ***0.52*** | ***0.53*** | ***0.45*** | ***0.44*** | ***0.47*** |
| 250 | ***0.55*** | ***0.54*** | ***0.55*** | 0.48 | ***0.48*** | ***0.50*** |
| 275 | 0.56 | 0.55 | 0.56 | 0.49 | 0.50 | 0.51 |
| 300 | ***0.57*** | ***0.56*** | ***0.57*** | ***0.50*** | ***0.51*** | ***0.53*** |
| 325 | 0.58 | 0.57 | 0.59 | 0.52 | 0.52 | 0.55 |
| 350 | 0.59 | ***0.57*** | ***0.61*** | 0.53 | ***0.54*** | ***0.57*** |
| 375 | 0.59 | 0.58 | 0.61 | 0.54 | 0.55 | 0.58 |
| 400 | ***0.59*** | ***0.59*** | ***0.61*** | ***0.55*** | ***0.56*** | ***0.58*** |
| 450 | 0.59 | ***0.59*** | ***0.61*** | 0.56 | ***0.58*** | ***0.59*** |
| 500 | 0.59 | ***0.59*** | ***0.57*** | 0.56 | ***0.58*** | ***0.57*** |
| 550 | 0.57 | 0.59 | 0.50 | 0.56 | 0.59 | 0.52 |
| 600 | 0.55 | 0.58 | 0.38 | ***0.56*** | 0.60 | 0.43 |

*Note: Values in red ink are interpolated or extrapolated from the curve fitting*.

Table 2. Comparison of DC and Calibration Runs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Temp | **ipb1-29b He HPdrop/DC(CoreQ)Power** | | | **sri-ipb2-27b H2 HPdrop/DC(CoreQ)Power** | | |
|  | Slope(DC) | Slope(Q) | COP | Slope(DC) | Slope(Q) | COP |
| 150 | 0.49 | 0.53 | 1.07 | 0.41 | 0.58 | 1.17 |
| 250 | 0.54 | 0.63 | 1.09 | 0.48 | 0.74 | 1.27 |
| 300 | 0.56 | 0.70 | 1.13 | 0.51 | 0.93 | 1.43 |
| 400 | 0.59 | 0.61 | 1.00 | 0.56 | 0.75 | 1.16 |

*Note: COP: (HPdrop(Q)-HPdrop(DC))/Power + 1*



Figure 1 HPdrop/DCpower vs. Temperature of DC



Figure 2 HPdrop/DC(coreQ)power vs. Temperature of DC & Calibration



Figure 3 He vs H2