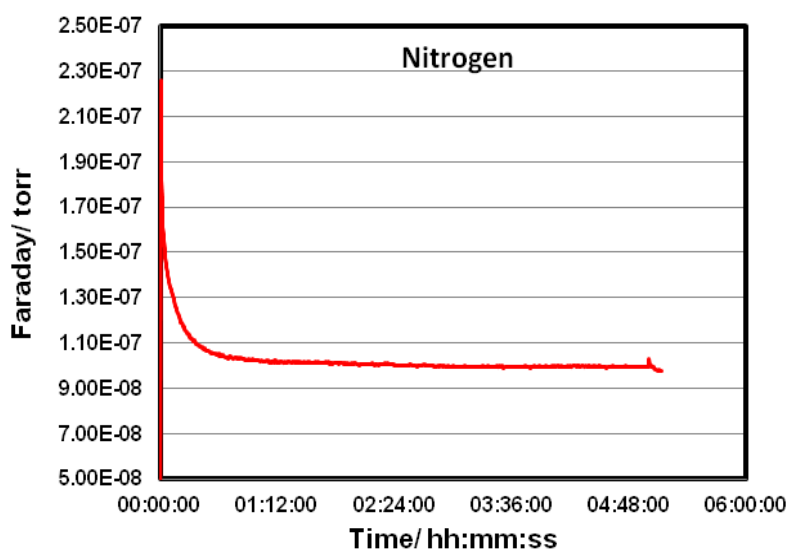
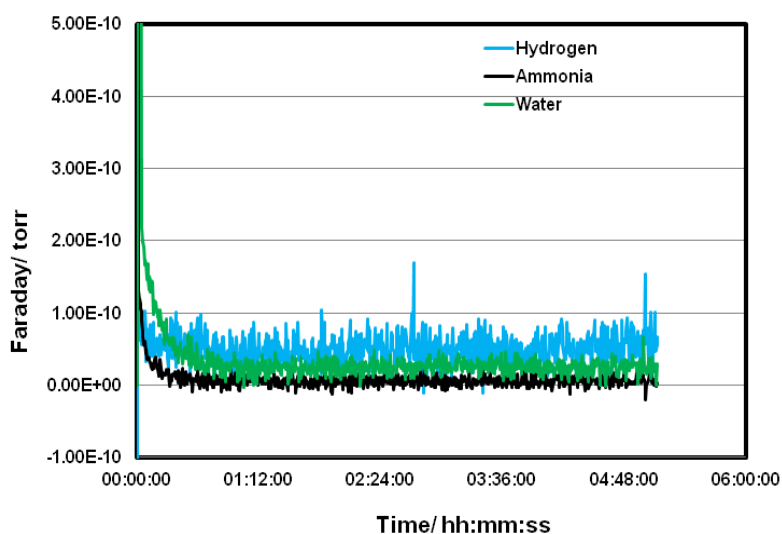


Supplementary Information

Figure S1. Mass spectra obtained under the conditions shown in Figure 10 (a) $\text{N}_{2(g)}$; and (b) H_2O , $\text{NH}_{3(g)}$, and $\text{H}_{2(g)}$ were monitored.



(a)



(b)

Table S1. Interatomic distances in Li_4NH (LT and HT phase) obtained from Rietveld refinement against PXD data at 298K.

Interatomic distances/Å	LT- Li_4NH (tetragonal)	HT- Li_4NH (Cubic)
Li1-(N1,H1)	$4 \times 2.082(2)$ $4 \times 2.044(2)$	2.1418(1)
Li1-(N2,H2)	$4 \times 1.949(2)$ $4 \times 2.556(3)$	

Table S2. Bond angles in Li₄NH (LT and HT phases) obtained from Rietveld refinement against PXD data collected at 298 K.

Bond angles/ °	LT-Li ₄ NH phase (tetragonal)	HT-Li ₄ NH phase (cubic)
Li1-(N1,H1)-Li1	4 × 75.00(5)	
	4 × 75.34(5)	
	4 × 122.76(8)	
	4 × 159.3(1)	
	2 × 85.3(1)	3 × 54.736(3)
	4 × 64.93(8)	3 × 125.264(3)
	4 × 102.43(4)	
	1 × 124.7(1)	
Li1-(N2,H2)-Li1	4 × 103.69(6)	
	2 × 121.8(1)	

Additional Supplementary Information:

Short video of SMC MW reaction in progress—experiment.avi.