

## Supporting Information

### Facile Synthesis of Anhydrous Alkaline Earth Metal Dodecaborate

#### **$\mathbf{MB_{12}H_{12}}$ ( $\mathbf{M = Mg, Ca}$ ) from $\mathbf{M(BH_4)_2}$**

Liqing He,<sup>a</sup> Hai-Wen Li,<sup>\*,b,c</sup> Nikolay Tumanov,<sup>d</sup> Yaroslav Filinchuk,<sup>d</sup> Etsuo Akiba<sup>a,b,c</sup>

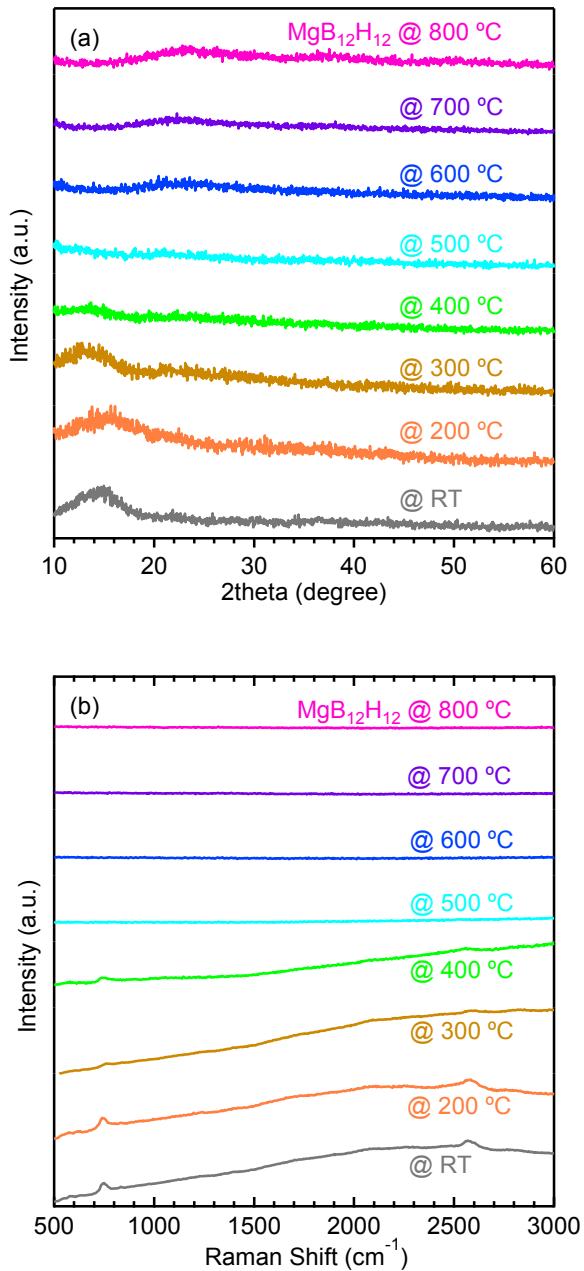
<sup>a</sup>Department of Mechanical Engineering, Faculty of Engineering, Kyushu University,  
Fukuoka 819-0395, Japan

<sup>b</sup>International Research Center for Hydrogen Energy, Kyushu University, Fukuoka 819-  
0395, Japan

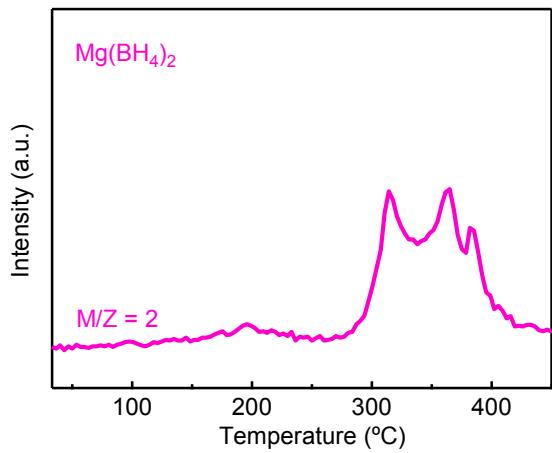
<sup>c</sup>WPI International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu  
University, Fukuoka 819-0395, Japan

<sup>d</sup>Institute of Condensed Matter and Nanosciences, Université catholique de Louvain,  
Louvain-la-Neuve 1348, Belgium

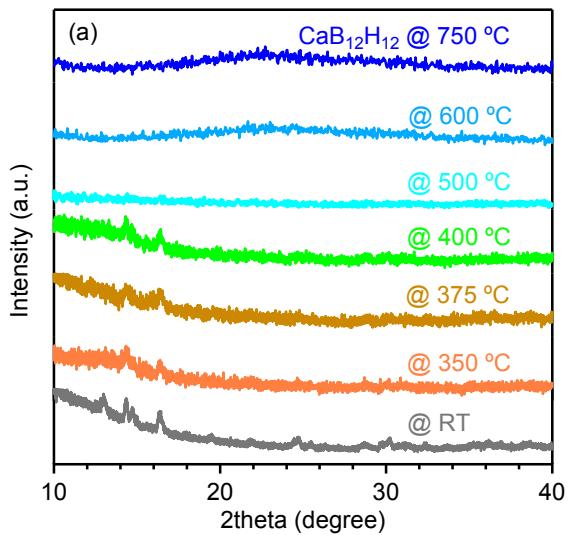
**\*Corresponding Author:** li.haiwen.305@m.kyushu-u.ac.jp.

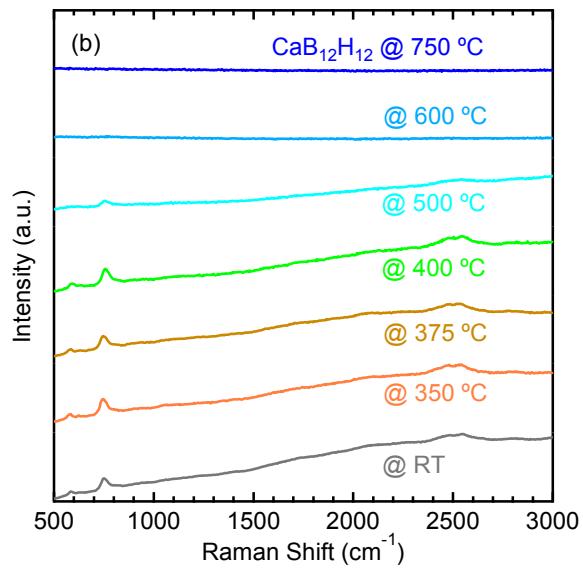


**Figure S1.** (a) XRD patterns and (b) Raman spectra of  $\text{MgB}_{12}\text{H}_{12}$  at room temperature and heated up to respective temperatures.



**Figure S2.** MS spectra of  $\text{Mg}(\text{BH}_4)_2$  (mass numbers 2 represents  $\text{H}_2$ ).





**Figure S3.** (a) XRD patterns and (b) Raman spectra of  $\text{CaB}_{12}\text{H}_{12}$  at room temperature

and heated up to respective temperatures.