Supporting information

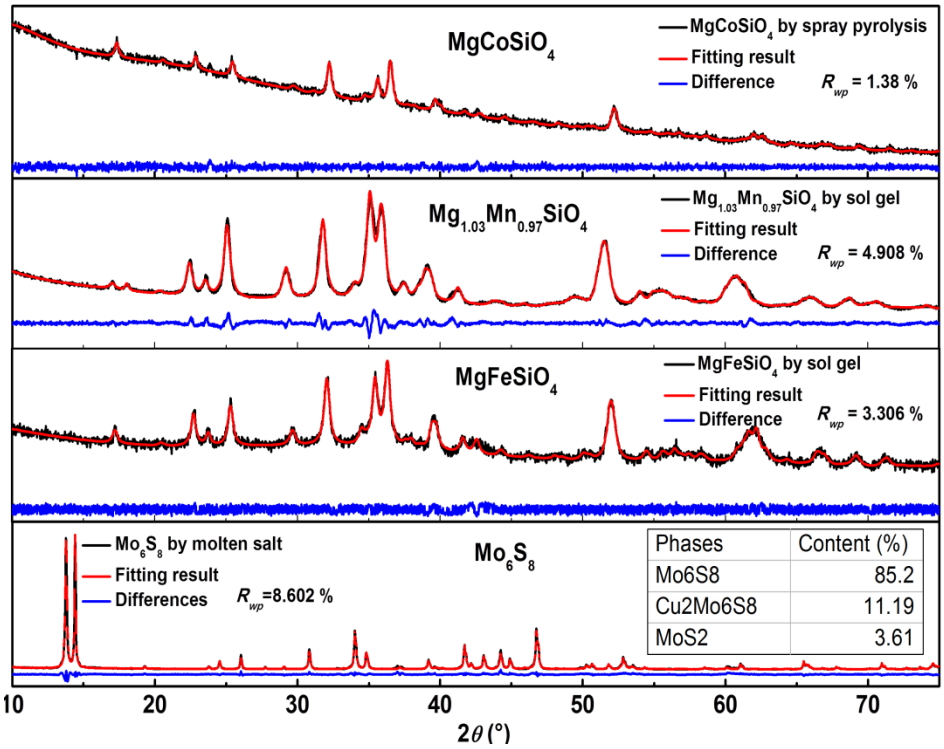

Figure S1. Typical Pawley fitting of the XRD patterns for $MgMSiO_4$ (M=Fe, Mn, Co) and Rietveld refinement for chevrel phase Mo_6S_8.

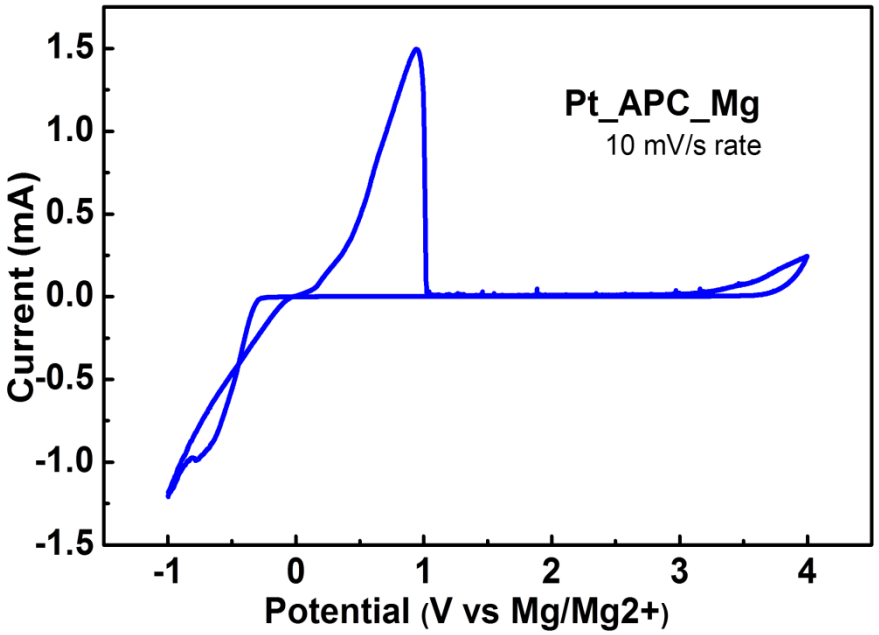

Figure S2. Cyclic voltammogram of APC solution by using Pt as working electrode and Mg strip as counter/reference electrode at a scan rate of 10 mV/s.

Movies of Mg moving between Mg sites in the a- and c- direction are labelled MgFeSiO4_2x1x2_a-direction.avi and MgFeSiO4_2x1x2_c-direction.avi. Movies showing diffusion of Mg to a neighboring empty Fe site and Fe into a neighboring empty Mg site are named MgFeSiO4_2x1x2_Mg-to-Fesite-b-direction.avi and MgFeSiO4_2x1x2_Fe-to-Mgsite-b-direction.avi, respectively. The movies were produced with VMD [1] utilizing the Tachyon ray tracing library [2]. Corresponding visualization states for the program VMD are provided.

In the movies, elements are colored as following: Blue = Si, Red = O, Orange = Mg and Purple = Fe. The moving atom is enlarged in radius for easier visualisation.

Please see separate files for the movies.

1. Humphrey, W., A. Dalke, and K. Schulten, *VMD: Visual molecular dynamics.* Journal of Molecular Graphics, 1996. **14**(1): p. 33-38.
2. John, S., *An Efficient Library for Parallel Ray Tracing and Animation*, in *Computer Science Department*. 1998, University of Missouri-Rolla.