Supporting Information for

High ionic conductivity in melilite-type silicates

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Figure SI-1 – Rietveld refinement of the neutron diffraction pattern for Sr₂MgSi₂O₇ at room temperature (Institute Laue-Langevin, Grenoble, France).

Figure SI-2 – Evolution of lattice parameter for Sr₂MgSi₂O₇ as a function of temperature as determined by neutron diffraction. (Error bars are within the size of the marker)
**Figure SI-3** – Evolution of the lattice volume for Sr$_2$MgSi$_2$O$_7$ as a function of temperature as determined by neutron diffraction. (Error bars are within the size of the marker)

**Figure SI-4**. Polarization curve of a Pt/ Sr$_{1.7}$Na$_{0.3}$MgSi$_2$O$_7$ /Pt cell under solid oxide fuel cell operating conditions (hydrogen at the anode side and oxygen at the cathode side) measured under variable loads at 800°C.
Figure SI-5. Pictures showing water formation at the anode side during cell discharge under variable loads. Water vapor in the outlet hydrogen gas flow condensates in a glass tube outside the oven.