**Figure Information – Biomolecular Self-Assembly Under Extreme Martian Mimetic Conditions**

**Figure 1.** Spatial density functions of water around a central water molecule from neutron diffraction data and EPSR analysis for water in the presence of glycine (top) and water in the presence of glycine and Mg(ClO4)2. These surface contours contain the highest 30% probability areas of finding another molecule within a distance of 5 Å from the central molecule.

**Figure 2.** Spatial density functions of water around a central amine group (top) or a central carbonyl group (bottom) of glycine without Mg(ClO4)2 at 25oC (left), with Mg(ClO4)2 at 25oC (middle), and with Mg(ClO4)2 at -20oC (right) from neutron diffraction data and EPSR analysis. These surface contours contain the highest 15% probability areas of finding a water molecule within a distance of 5 Å from the central molecule.

**Figure 3.** Cluster size distribution predicted from EPSR simulations as determined using the definition for hydrophilic clustering found in the “glycine association” section. Distribution plotted on a logarithmic scale to highlight differences in cluster size distributions. Proportion of clusters containing only one glycine molecule shown in black and white.

**Figure 4.** Labelling convention for glycine molecule used in present research (top). EPSR simulated RDFs of amine hydrogens from a carbonyl oxygen (middle) and side chain hydrogens from a side chain hydrogen (bottom). Spectra are vertically offset for clarity.

**Figure S1.** OwOw radial distribution functions. Spectra vertically offset for clarity.

**Figure S2.** OwH­­w radial distribution functions. Spectra vertically offset for clarity.

**Figure S3.** HxOw radial distribution functions. Spectra vertically offset for clarity.

**Figure S4.** O1Hw radial distribution functions. Spectra vertically offset for clarity.

**Figure S5.** Cluster size distribution from EPSR simulations determined using the definition of hydrophilic clustering found in the “glycine association” section. Proportion plotted on a logarithmic scale to highlight differences in cluster size distributions. Proportion of unclustered glycine monomers shown in black and white.

**Figure S6.** O1Hx radial distribution functions. Spectra vertically offset for clarity.

**Figure S7.** N1Ow radial distribution functions. Spectra vertically offset for clarity.

**Figure S8.** CcOw Radial distribution functions. Spectra vertically offset for clarity.

**Figure S9.** O1Ow radial distribution functions. Spectra vertically offset for clarity.

**Figure S10.** EPSR fits to F(Q) data for aqueous glycine at 25oC. Spectra vertically offset for clarity.

**Figure S11.** EPSR fits to F(Q) data for glycine in aqueous Mg(ClO4)2 at 25oC. Spectra vertically offset for clarity.

**Figure S12.** EPSR fits to F(Q) data for glycine in aqueous Mg(ClO4) at -20oC. Spectra vertically offset for clarity.

**Figure S13.** O1Mg radial distribution functions. Spectra vertically offset for clarity.

**Figure S14.** HxClp radial distribution functions. Spectra vertically offset for clarity.