We thank again the anonymous referees for their efforts in improving the manuscript. Our responses to the comments are outlined in blue, and the modified portions of the manuscript are shown in *italics*.

Review #1

Many issues pointed by the reviewers were addressed in the revised manuscript. However, some unclear issues still remain in the revised manuscript. Before publication, the following issues are needed to be resolved.

Line 39: Na2SO4.10H2O

Change the terms to “Na2SO4•10H2O” Do not use “period”. Use “the centered dot”.

We have changed the period to the centered dot.

The suggested mechanism of the sulphate-depletion of the SSA is mirabilite ($Na_2SO_4{\cdot}10H_2O$) precipitation...

Line 316: silicon (1,0,0) surface

Change to silicon (1, 0, 0) surface

We have added the spaces.

Previously, wetting the upper molecular layers of a silicon (1, 0, 0) surface...

Line 432: mirabilite (Na2SO4•10H2O)

Because mirabilite (Na2SO4•10H2O) mentioned already in the line of 39, change to “mirabilite” or “Na2SO4•10H2O” here.

We modified the sentence as follows:

When the ice temperature ranges below −6.4°C mirabilite starts to precipitate out from the brine...

Review #2

The manuscript was very carefully corrected.

The temperature measurement is probably not ideal, but it is reproducible, and at least indirectly verified.

As for the presumably supercooled (liquid) brine, the explanation is now clear. This point had possibly been convincing to most microscopists, but not to the other readers.

"Pure" silicon wafer, without surface cleaning, might be quite contaminated, and it has an ill-defined surface chemistry, obvious from a large water contact angle (>10°), even when it is totally dust-free (as guaranteed by the manufacturer). The problem is that this change is not uniform. So it would be very good to add more details, e.g. was the wafer cut (which often entails protection by a polymer, which again changes the surface chemistry)?

We added a more detailed characterization of the wafer surface and how we handled it. We did not cut the wafer nor applied any polymeric coating; the wafer was scored by the manufacturer and we just manually (using gloves) cleaved it along the scoring into smaller tiles. However, we use the Peltier stage also for other experiments, and although we clean the surface after each experiment (e. g. with isopropyl alcohol), we cannot exclude surface contamination due to the experimental usage.

We have modified the text followingly:

The surface of the cooling stage was made from a pure, commercially available ultra-flat silicon wafer (P-type, boron-doped, orientation (1, 0, 0); Ted Pella, Inc.). The front surface of the wafer was polished and scored by the manufacturer; we snapped the wafer along the scoring into small tiles. We provided no additional surface treatment. The silicon tile was glued to the Peltier cell with a highly thermally conductive adhesive, compatible with the low temperature and reduced gas pressure environment of the microscope. After each experiment, we cleaned the surface of the silicon pad with isopropyl alcohol; however, surface contamination due to the experimental usage of the Peltier stage is not excluded.