<u>Point-to-point answers to the comments of Referee #2</u>

The authors would like to thank the referee for his/her time reading the manuscript and placing the comments. We also acknowledge his positive feedback and valuable suggestions.

RC: 1)

In Fig. 2, 3, and 7, it could be more intuitive to use the temperature as the x axis, instead of the time.

AC1:

The authors would like to thank the Reviewer for his practical suggestion. Indeed plotting the data as a function of temperature will be more perceptive. However, this is only possible in the range of scan where the independent parameter (temperature in this case) is single-valued, otherwise the plot will be confusing, e.g. Fig. AC2.1.

Since we focus in this manuscript on the water restructuring upon cooling, plotting the SHG liquid signal as a function of temperature during cooling is the correct choice. Since Figure 3 is a subset of Figure 2, we have only replaced Figure 3 with a new one that now includes temperature as the x axis (Figure AC2.2).

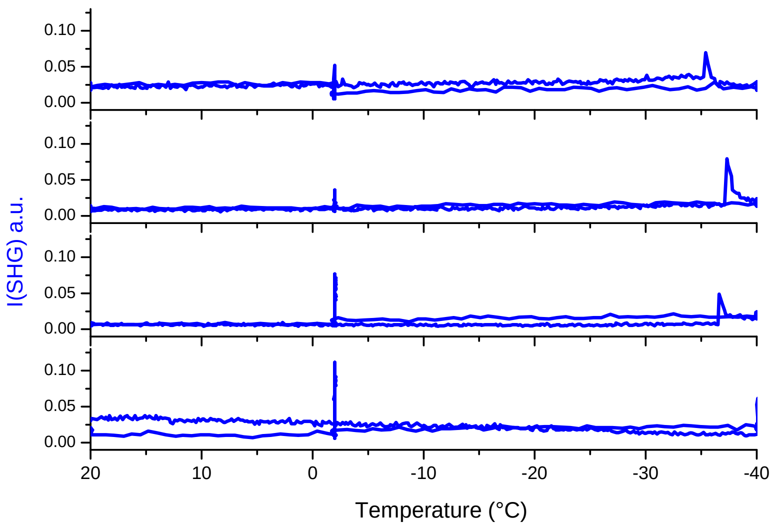

Figure AC2.1: This figure shows haw Figure 3 would look like if we plot the SHG signal of the complete scans with temperature is the x-axis.

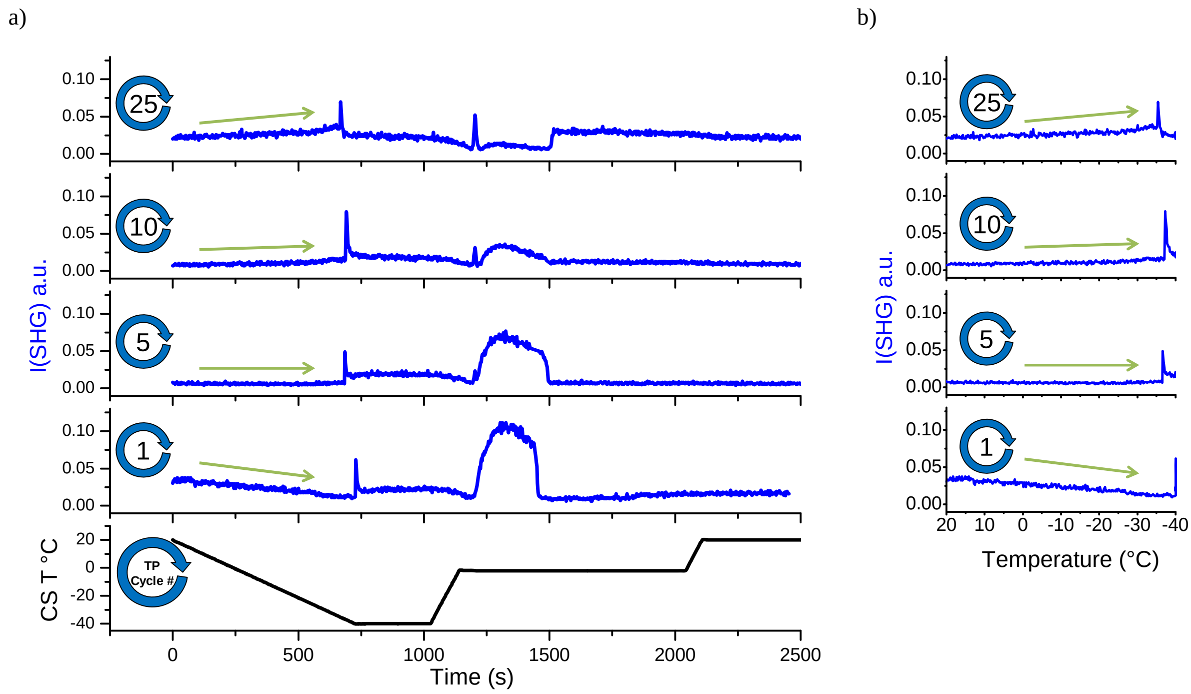

Figure AC2.2: SHG liquid signal as a function of time and temperature during cooling. Figure 3 in the manuscript has been replaced with this Figure.

Figure 7 cannot be plotted using temperature as the x axis because the temperature around the freezing and melting peaks is almost constant (i.e. again a not single-valued relation).

RC: 2)

The data presented in the manuscript may not directly related to “cloud history”, as indicated by the title.

AC2:

As mentioned in the abstract and introduction, an aerosol-containing cloud droplet can go through different freeze-melt or evaporation-condensation cycles, so that not only the aerosol surface structure may change, but also ionic strength and pH of the cloud droplet. We conclude that the cloud history may affect the contained aerosol particles. However, we agree with the Reviewer that the title of the original manuscript is may be improved. The new title is being discussed between the authors and will finally be decided after finalizing the reviewed manuscript version.*

** During cloud formation, water vapor condenses on aerosol particles forming liquid suspended water droplets in about a 100% RH environment. Cloud droplets are constantly forming and dissipating. Depending on the atmospheric conditions (e.g. temperature, RH, or air draft) the cloud droplet change its size. In case of temperature increase, cloud mixing with drier air, or air sinking within the cloud, cloud droplets may evaporate (may also totally dissipate). Under these conditions the acidic, basic components or ionic strength in the cloud droplet will reach extreme values. We show in this manuscript that this may significantly change the surface properties of mineral oxide aerosols.*