Supplement of
Micro-spectroscopic and freezing characterization of ice-nucleating particles collected in the marine boundary layer in the Eastern North Atlantic

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This Supplement comprises of six figures (S1-S6).
Figure S1: Sampling location on Graciosa Island, Azores, during the Aerosol and Cloud Experiments in the Eastern North Atlantic (ACE-ENA) field campaign (Wood, 2019) and image of ground sampling site (Wang et al., 2021).
Figure S2: Representative backward trajectories for examined daytime and nighttime samples for corresponding sampling periods. The date in the panel title marks the time from which the 10-day backward trajectories are calculated (black dot), and the additional black dots mark the trajectories’ locations 5 days prior to their arrival at the sampling site. The trajectories are colored by their pressure level (hPa).
Figure S3: Process of ice-nucleating particle (INP) identification using multi-model instrument approach following Knopf et al. (2014).
Figure S4: Representative false color particle maps derived by STXM/NEXAFS for the daytime and nighttime samples. The upper panels for each sample provide particle population mixing state where IN - inorganic, EC - elemental carbon, OC - organic carbon. The corresponding lower panels indicate the range in organic volume fraction (OVF) per particle, where organic dominated particles are in green (organic mass is > 80%) and inorganic dominated particles are blue (inorganic mass is > 80%). Scale bar indicates 5 µm.
Figure S5: Size-resolved fractional particle composition for particle samples determined by micro-spectroscopic single-particle analysis as a function of area equivalent diameter (AED). From left to right: first column: CCSEM/EDX derived particle-type classes as ‘processed sea salt with mineral dust and organic matter’, ‘sea salt’, ‘processed sea salt with mineral dust’ and ‘organic matter with chlorine’. Second column: STXM/NEXAFS derived particle mixing state: IN - inorganic, EC - elemental carbon, OC - organic carbon. Third column: organic volume fraction (OVF).
Figure S6: EDX spectra of identified INPs present in daytime and nighttime samples given in Fig. 6 and Table 3. *corresponds to the signal from the substrate (Si$_3$N$_4$ coated silicon wafer chips) and the chamber/holder (Al).
References

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