In the discussion version of this manuscript, the authors calculated glass transition (T_g) curves and their associated errors using parameterizations found in Zorbist et al. (2008). For that parameterization, the authors used a value of 140 K for the T_g of water, as found in the review by Angell (2002). The authors recognize, however, that a more accepted value $T_{g,\ water}$ = 136 K is often found in the literature (Zobrist et al., 2008; Koop et al., 2011).

Thus, the glass transition lines in the new Figure 13 (see below) have now been calculated using $T_{g,\ water}$ = 136 K. Correspondingly, these new glass transition lines were used in eq. 1 for the viscosity analysis in section 3.4. As a result, the viscosity of the C6/C10 particles/coatings have been calculated to be 6.4×10^5 and 3.7×10^5 Pa s under the ice nucleation conditions in this study at 210 and 215 K, respectively. These values are slightly lower than the previously calculated values of 8.7×10^5 and 6.3×10^5 Pa s when $T_{g,\ water}$ = 140 K was used.

FIGURES

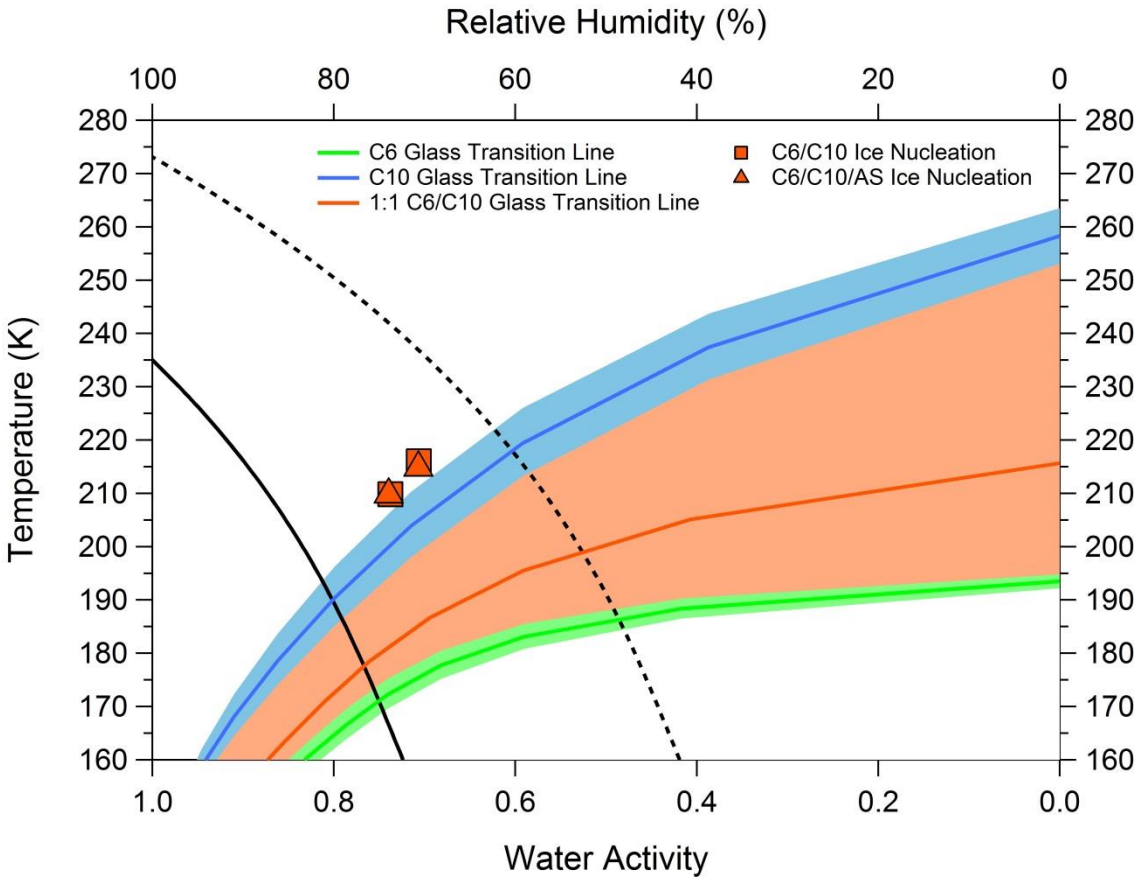

Figure 13. The glass transition temperatures of C6, C10, and 1:1 C6/C10 shown as a function of water activity. The pure C6 and pure C10 glass transition curves are experimental data from Zobrist et al. (2008) using differential scanning calorimetry. The 1:1 C6/C10 glass transition curve was calculated using a mixing rule that depends on weight percent and molar mass. Also plotted are the conditions (temperature and RH) for depositional ice nucleation on C6/C10 and C6/C10/AS, where the organic particle/coating was visually and spectrally shown to behave like a highly viscous (semi-)solid or glass. For clarity, the ice melting curve (black dashed line) and homogeneous freezing line [black solid line, (Koop et al., 2000)] are also plotted.

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