

**Kinetics Study of Heterogeneous Reactions of
Ozone with Unsaturated Fatty Acids Single Droplets
Using Micro-FTIR Spectroscopy**

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Electronic Supplementary Information

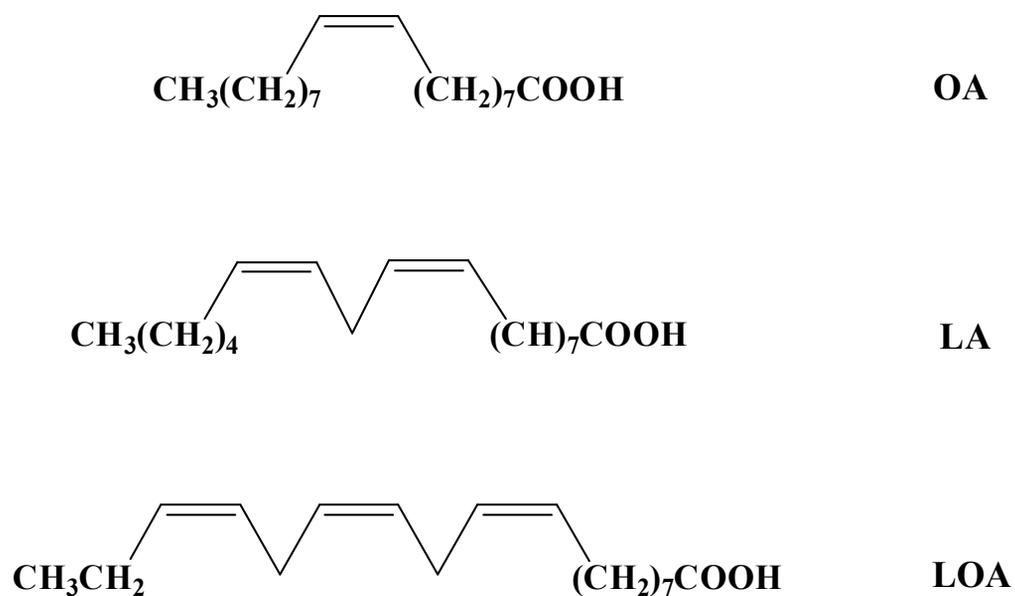
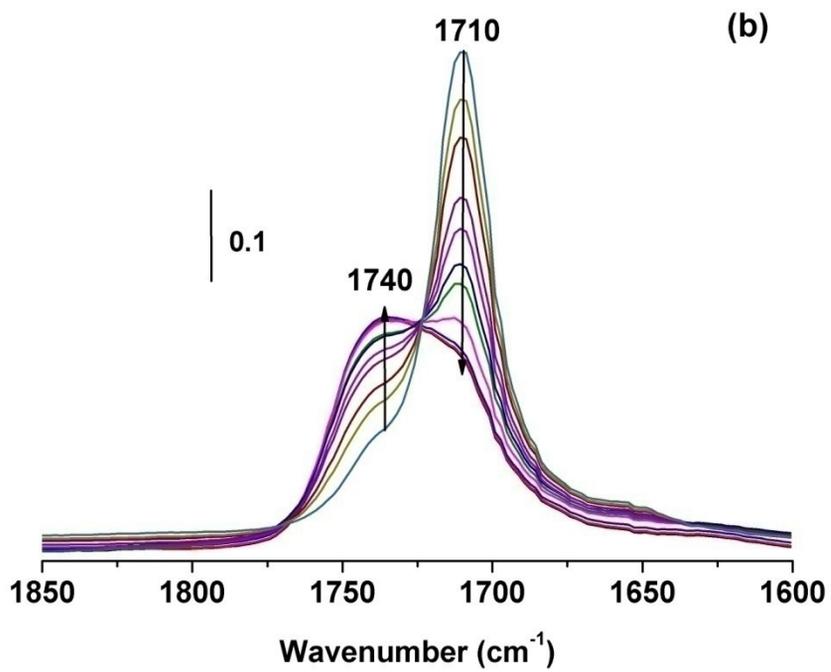
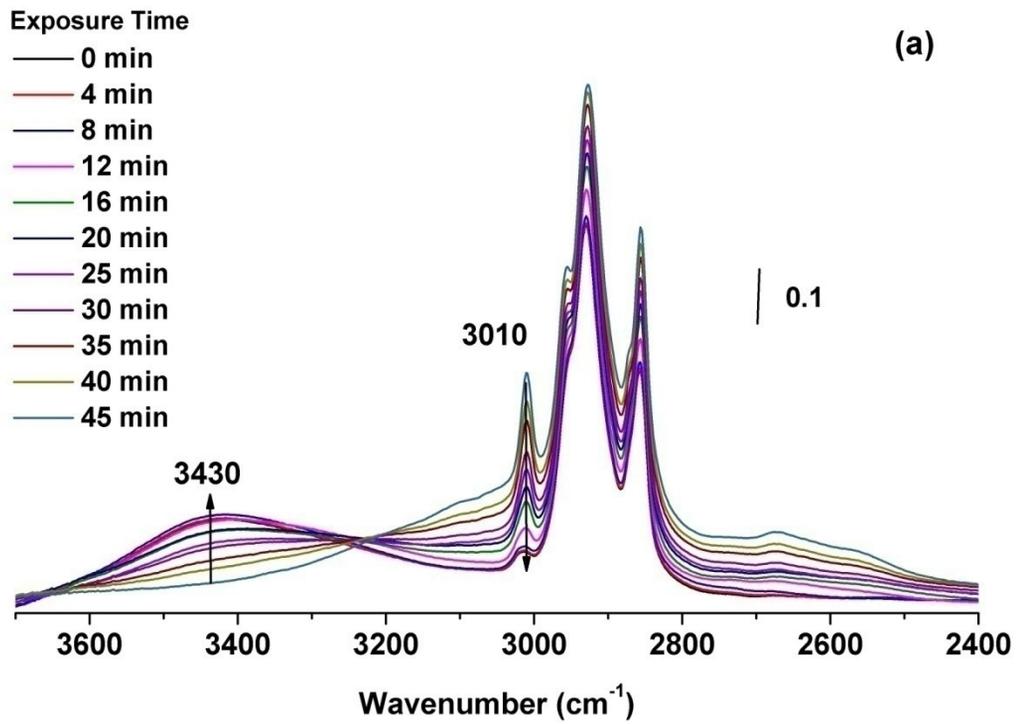


Fig. S1 Chemical structures of oleic acid (OA), linoleic acid (LA) and linolenic acid (LOA).



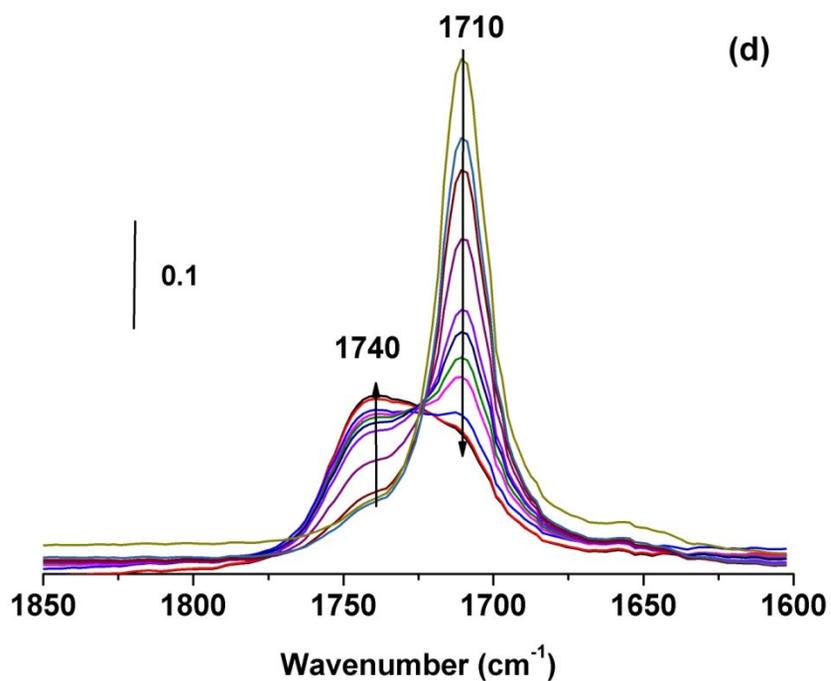
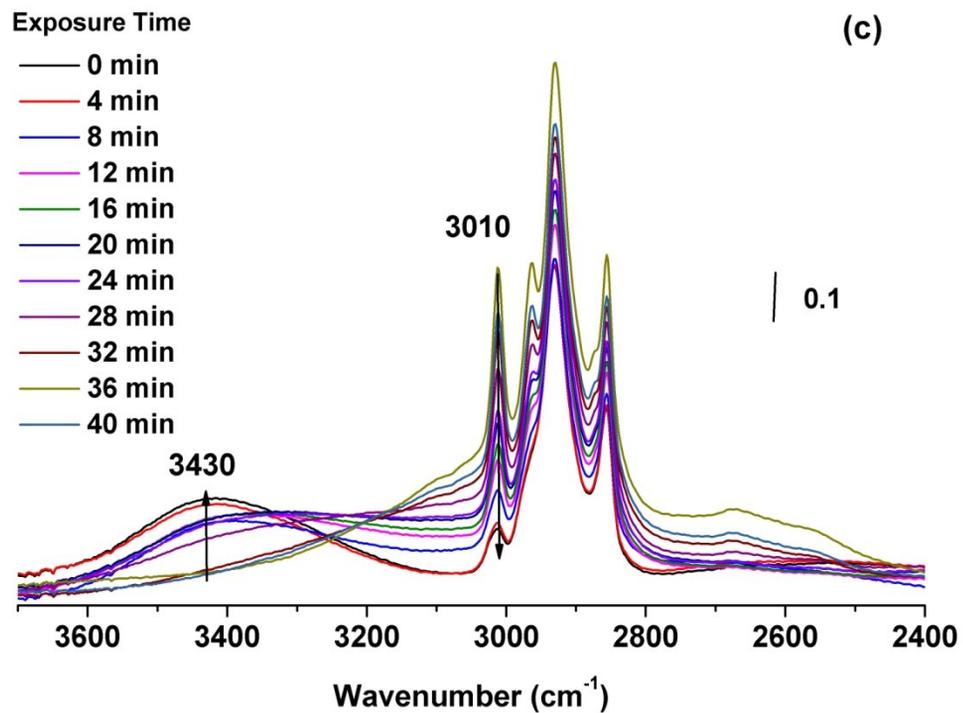


Fig. S2 The FTIR spectra of (a) ~ (b) LA, (c) ~ (d) LOA single droplets at different ozone exposure time during the reaction. Conditions: $[\text{O}_3] \sim 10$ ppm, room temperature, and $\text{RH} \sim 0\%$. The Y-axis stands for absorbance.

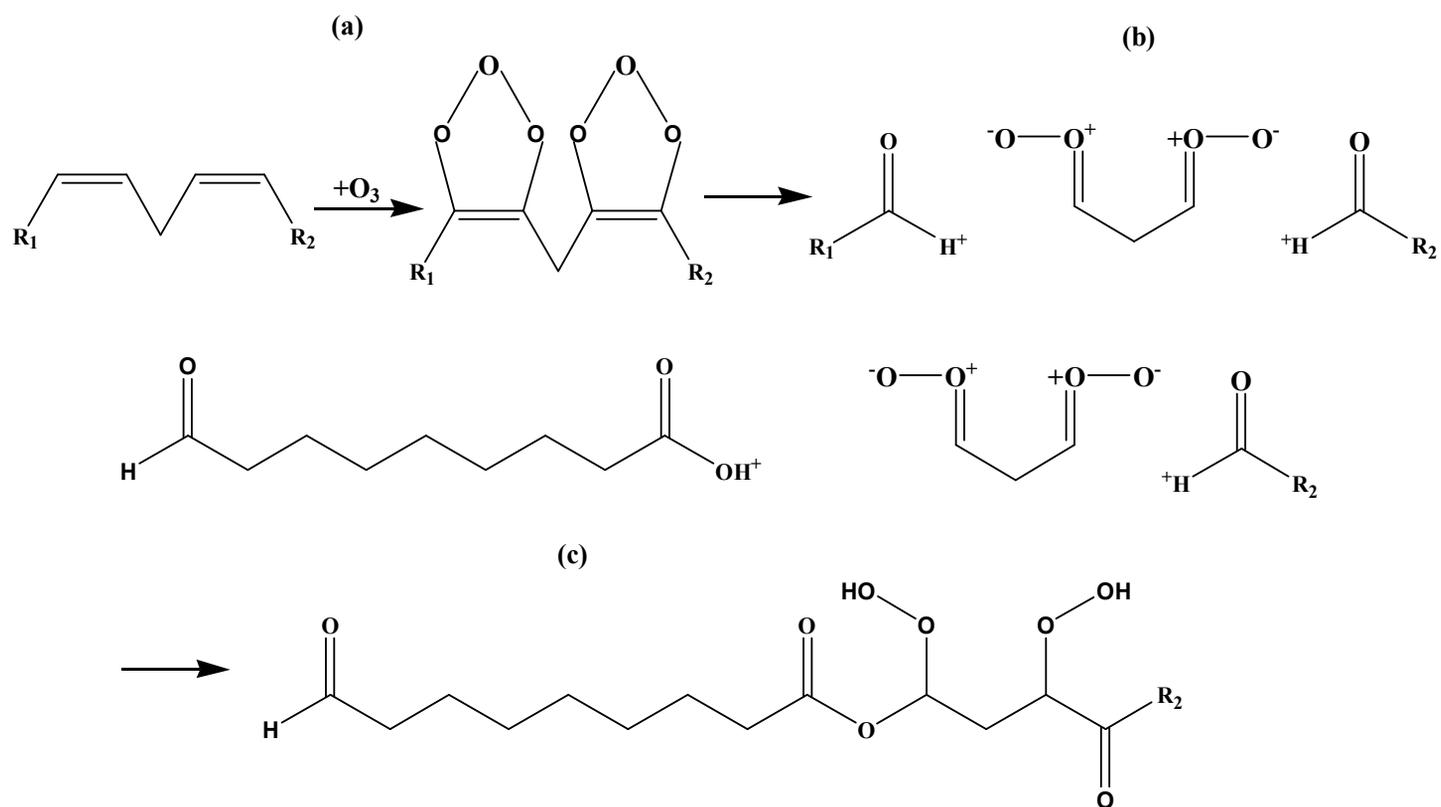
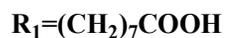


Fig. S3 Proposed pathway for LA (a) reaction with ozone. Ozone attack on double bonds leads to formation of Criege intermediate (b), followed by its recombination with carboxyl group to yield α -acyloxyalkyl hydroperoxide (c).

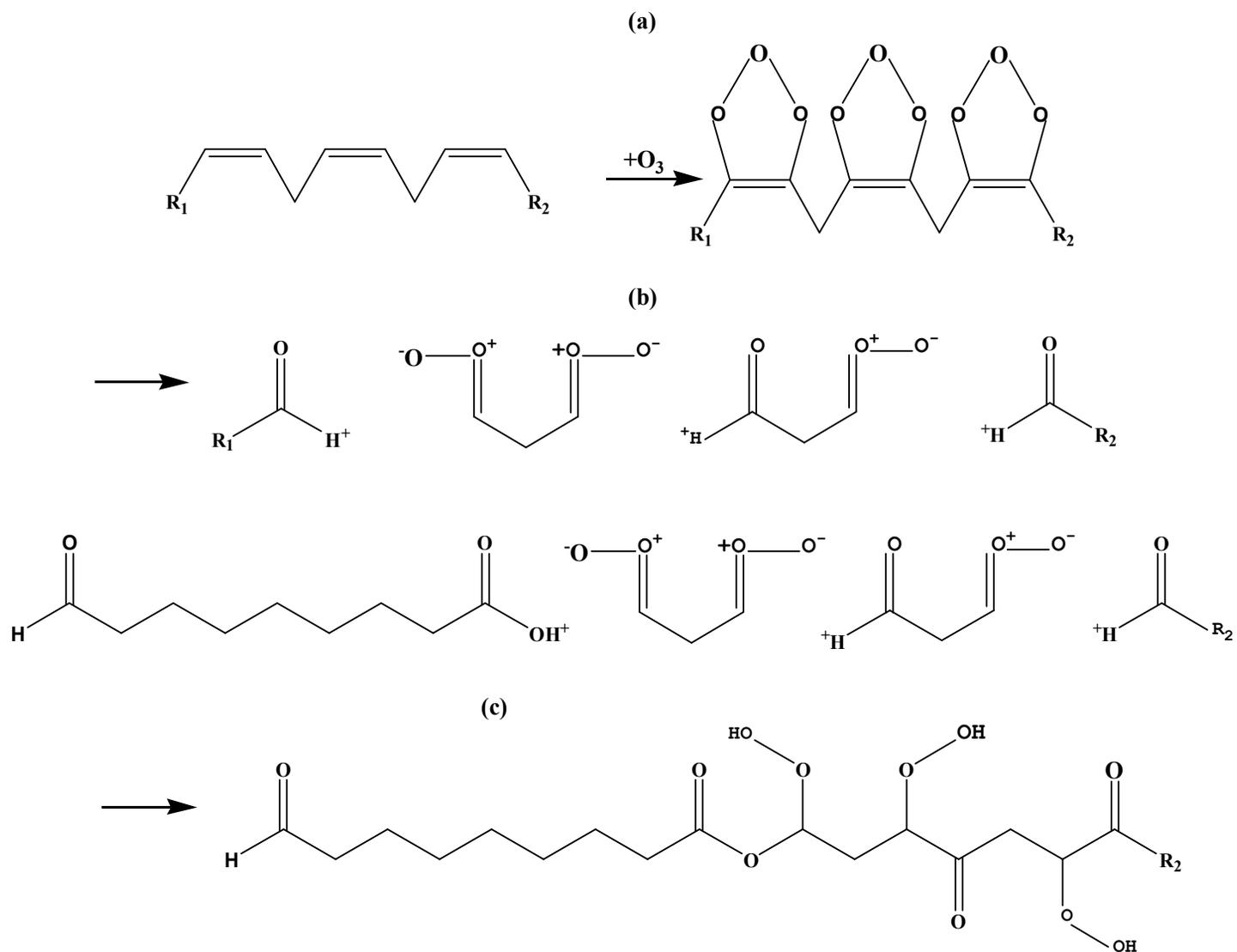
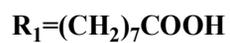


Fig. S4 Proposed pathway for LOA (a) reaction with ozone. Ozone attack on double bonds leads to formation of Criege intermediate (b), followed by its recombination with carboxyl group to yield α -acyloxyalkyl hydroperoxide (c).

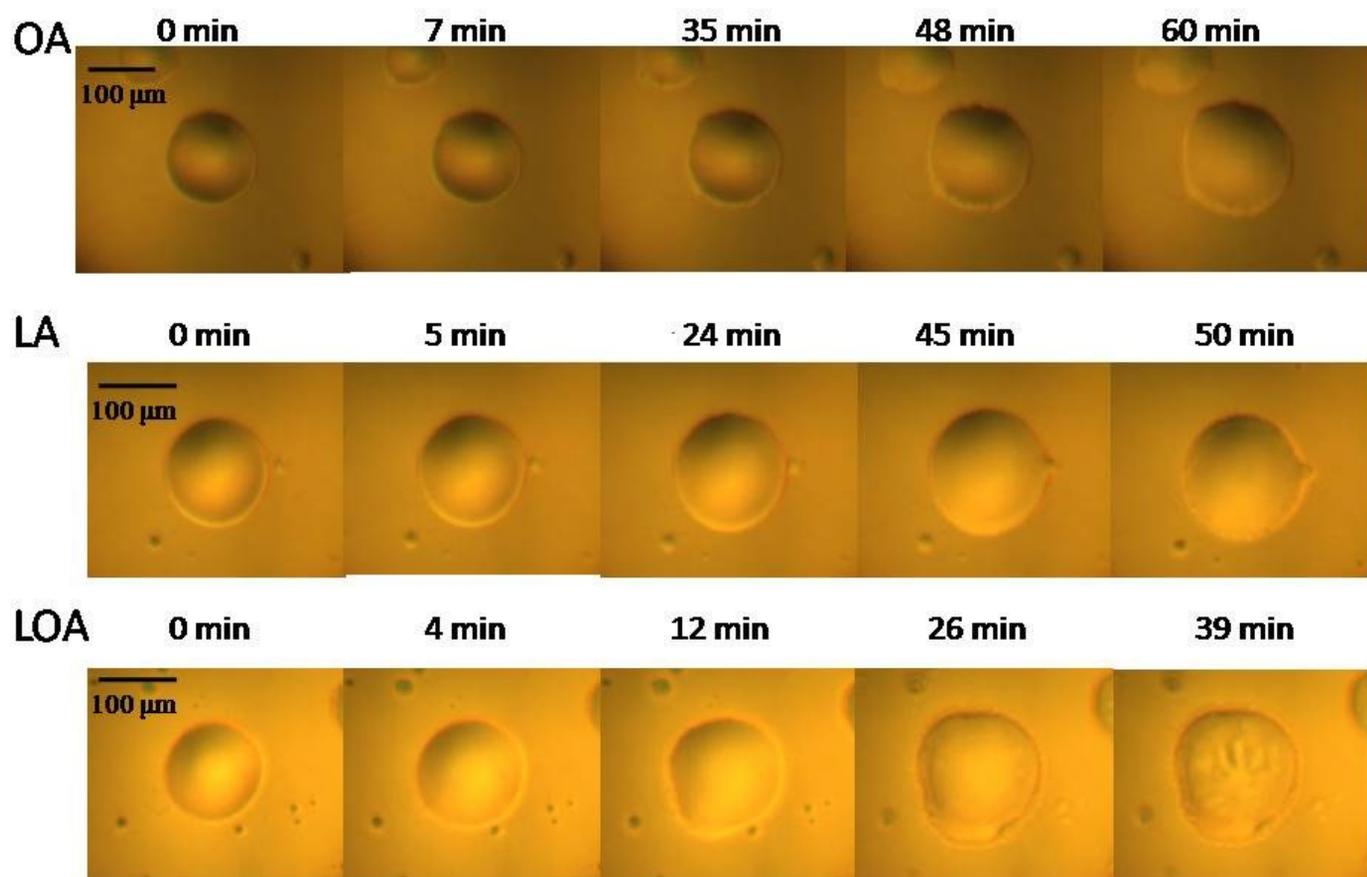


Fig. S5 The morphology image changes of the ozone-processed OA, LA and LOA single droplet as a function of the reaction times. Conditions: $[O_3] \sim 10$ ppm, room temperature, and RH $\sim 0\%$.

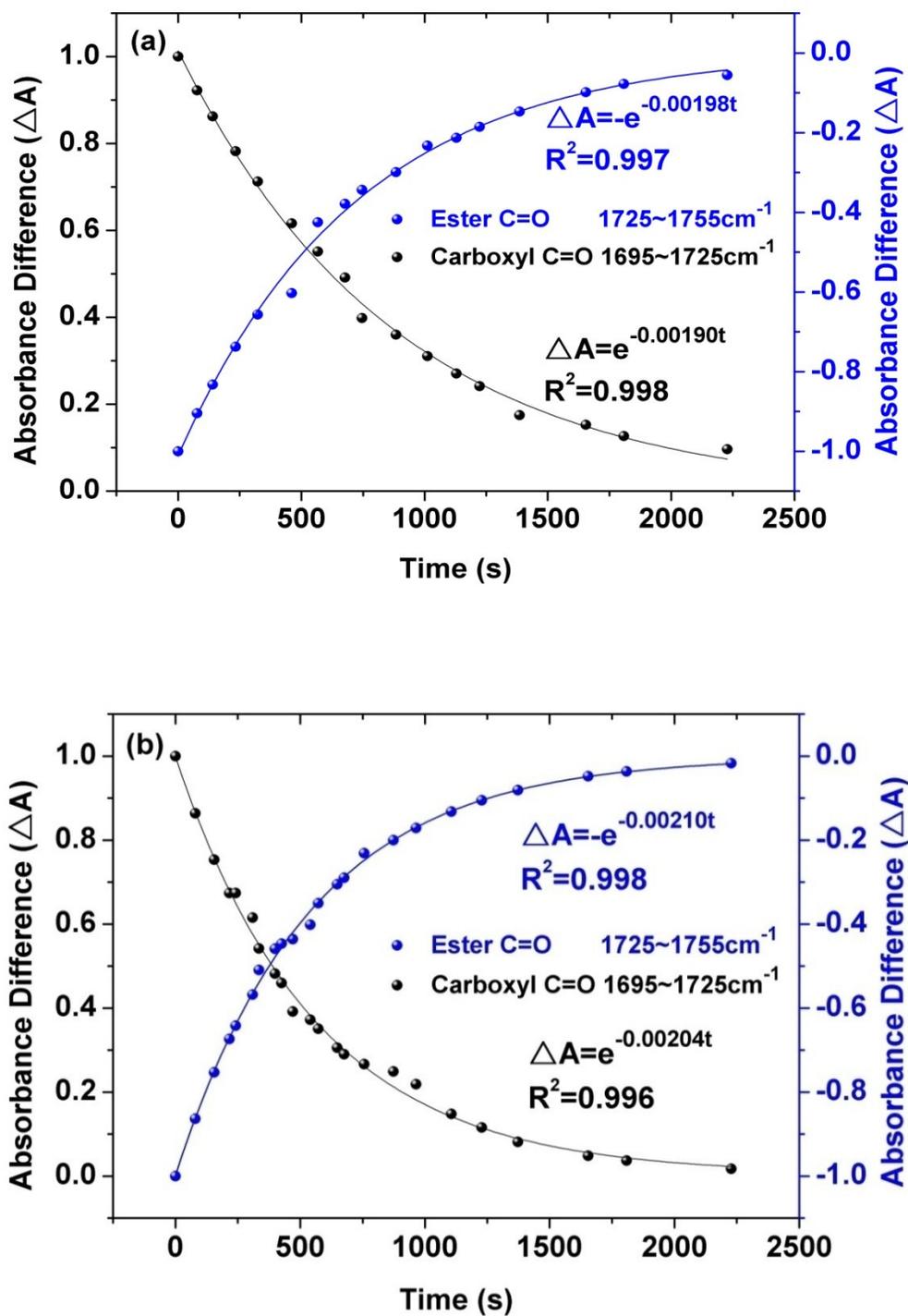


Fig. S6 Temporal changes in the infrared spectra focusing on C=O stretching bands of (a) LA and (b) LOA single droplets. The absorbance difference data (circles) in each band was exponentially fit (lines) to derive the k_{app} . Conditions: $[\text{O}_3] \sim 10$ ppm, room temperature, and RH $\sim 0\%$.

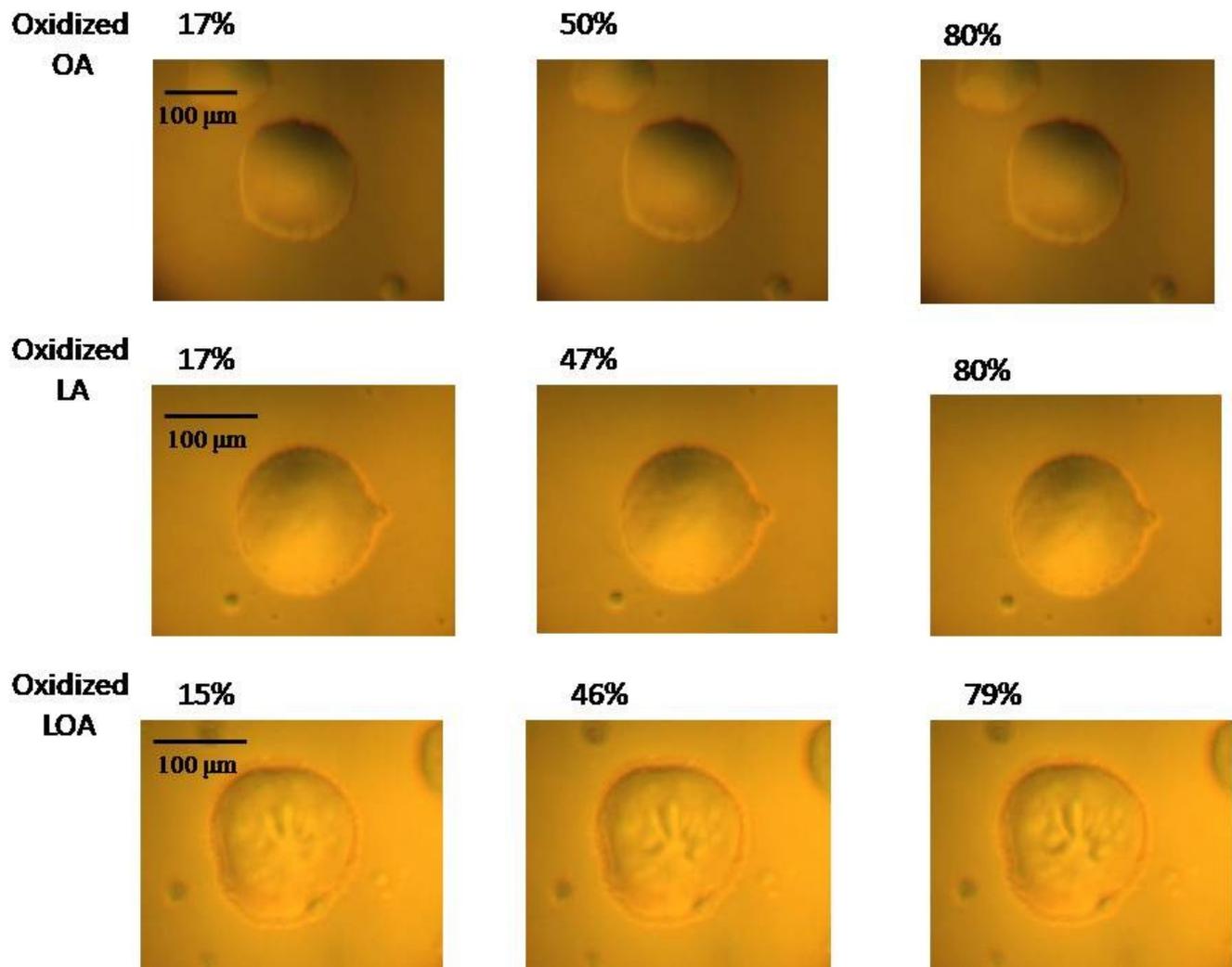


Fig. S7 The morphology image changes of water uptake among the oxidized OA, LA and LOA single droplet as a function of RHs.