Supplement of

Atmospheric measurements at Mt. Tai – Part I: HONO formation and its role in the oxidizing capacity of the upper boundary layer

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Figure S1: Photos taken around the summit station (Photo copyright: Chaoyang Xue). The polluted layer is visible in photos (A), (B), and (C). (D): The Jade Emperor Peak at sunset; (E): A overlooking view of Tai’an city (south of the summit station) at night. (F): Clouds at the summit level (southeast of the summit station). Figure S2: Diurnal profiles of (A): temperature (T), (B): pressure (P), and (C): the atmospheric relative humidity (RH) observed at the summit of Mt. Tai. Figure S3: Diurnal variations of (A): HONO, (B): PM$_{2.5}$, and (C): NO$_2$ observed at the summit station in winter, spring, and summer. Figure S4: Comparison of night-time (18:00 – 5:00) average (A): SO$_2$, (B): O$_3$, (C): CO, and (D): PM$_{2.5}$ observed at the foot station (Left axis in blue) and summit station (Right axis in orange) during the same period from 9th to 31st July. Figure S5: Windrose plots of the measurement in (A): winter, (B): spring, and (C): summer. Figure S6: OH concentrations (red line) used in this study and corresponding HONO$_{ps}$ and P$_{un}$ (red lines). Black lines represent OH level reduced by 30% and corresponding HONO$_{ps}$ and P$_{un}$. Blue lines represent OH level enlarged by 30% and corresponding HONO$_{ps}$ and P$_{un}$. Figure S7: (A): The measured particulate nitrate, pNO$_3$ (with unit converted from µg m$^{-3}$ to ppbv) by the filter method and the measured NO$_x$ (ppbv), and (B): their correlations from 12th June to 12th July. Caused by variable molar masses, NO$_x$ species can be only specified in mixing ratios (ppbv). Figure S8: Relative contribution of P(OH)$_{HONO_{net}}$ to P(OH)$_{sum}$ at the foot and the summit stations.
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Figure S7: (A): The measured particulate nitrate, pNO$_3$ (with unit converted from $\mu$g m$^{-3}$ to ppbv) by the filter method and the measured NO$_3$ (ppbv), and (B): their correlations from 12$^{th}$ June to 12$^{th}$ July. Caused by variable molar masses, NO$_3$ species can be only specified in mixing ratios (ppbv).

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