This manuscript summarizes results from a summertime study at mt. Tai in China where aerosol samples, ozone, and environmental parameters were measured. The authors determine daytime/nighttime concentrations and $\delta^{13}C$ of various carboxylic acids in an effort to characterize the role of bVOCs on SOA formation and aging. The paper is overall well-written although some parts need improvements. My major concern is about interpretation of the daytime/nighttime data. First of all, the standard deviations of the average values presented throughout the paper are rather large which mean that although the average values may be slightly different during day and night, statistically there's not a significant difference between the observations. These need to be addressed/corrected throughout the paper. Secondly, as indicated in L171-172, nighttime data represent free tropospheric measurements, meaning whatever was left in the residual layer from daytime, so nighttime observations aren't truly representing nighttime emissions/oxidations. The most unique aspect of the paper is the $\delta^{13}C$ analysis and interpretation of the results. I therefore support publishing the manuscript with major revisions after the authors have addressed my comments above as well as the other scientific comments and editorial suggestions listed below.

Scientific Comments:

- L40: define C6, Ph, Gly, and mGly (also in L249). Also how are the ratios mentioned here expected to behave for anthropogenic precursors?
- L41: how is 'related SOA with biogenic precursor' defined/determined?
- L164: What's the influence of organic acids on pH? Since the AIM model incorporates only the major inorganic ions, how do you think your pH results are affected by the presence of organic acids?
- L177: Looking at the observed variability in the values presented in Table 1, there isn't a significant change between daytime and nighttime concentrations although the average for some species is higher during daytime. I think this point needs to be clarified here and throughout the paper.
- L217: is the vegetation (tree types) also similar at this location and Mt. Fuji? I think that's more important rather than latitude and altitude of the sites.
- L243-245: Based on the average values in the table, total a-dicarbonyls were actually higher in daytime, so I don't think the data support the statement mentioned here. Do you mean only glyoxal and methyl glyoxal? Also based on the graph, it seems on most days the difference between daytime and nighttime total conc. of a-dicarbonyls was minor, so the pattern you're highlighting is not consistent. Please clarify.
- L265-267: I'm not understanding the difference between the beginning statement and the second part of the sentence. C4 is still a longer-chain diacid compared to C3. Please clarify and be more precise in what constitutes a longer-chain diacid.
- L269-275: Again it seems that given the variability of the observed diacid ratios in this study and those of previous studies, there's no significant difference between observations at different photochemical ages. I'm not convinced the conclusions regarding age are strongly supported by the data.
- L275-277: Photochemical oxidation is stronger compared to what? Nighttime or aqueous oxidation? Please clarify.
- L298-299: again given the variability observed in the daytime/nighttime data, the difference in the average values isn't significant.

- L328: what are the SOA tracers from these compounds? It will be useful to add to the legend in Table 4 what parent hydrocarbon is associated with each tracer.
- L339: some of the acids related to apinene and bcaryophyllene oxidation also correlate well with the diacids, so why only highlight isoprene contribution to SOA? In fact, the following sentence indicates that bSOA in general control production of the diacids, so perhaps it's better to combine these few sentences together.
- L360: I disagree with the statement that daytime ozone oxidation of isoprene and apinene was more important than OH oxidation of these compounds. Lifetime of these bVOCs even at background OH levels is a lot shorter than with respect to ozone oxidation. The observed correlation is just a correlation and not a causality. Related to this, I think the conclusion in the sentence starting in L454-455 needs to be removed.
- L366-368: SOA formation potential under different oxidants are also different, and so can contribute to the higher observed tracers during daytime.
- L381-382: In addition to the similar formation pathways (aqueous oxidation) for sulfate and oxalic acid, since oxalic acid formation is acid-catalyzed, one expects to have a good correlation with sulfate and oxalic acid (since the site is far from agricultural sources, I'm assuming most of the sulfate is acidic). Please add this discussion as a contributor to the good correlation as well.
- L393: aerosol composition is also very important for determining LWC of aerosols at a given RH.
- L428-429: Please indicate here specifically what trends in the ratios would suggest aging.
- L440-442: I'm a bit confused about this sentence. Higher values of glyoxal and methyl glyoxal relative to what? Please clarify. Also, from sentence above, I was under the impression that freshly emitted BVOCs are depleted in 13C, so why do the authors indicate that Gly and mGly are formed from oxidation of bVOCs enriched in 13C?
- L448 (also in the abstract): Indicate that 'average' concentration of some species are higher in the day compared to night since as mentioned above, the variability in the measured data was too high to conclude beyond the average.

Minor/Editorial Comments:

- L56: consider changing to "…, of which up to 80% are water soluble".
- L73: "… C2 is largely produced…"
- L80: change "liquid water content-enriched aerosol" to "aqueous aerosol"
- L87: change "independent" to "isolated"
- L 88: change "One of the severest air-polluted regions" to "one of the regions with worst air pollution in the world"
- L90: change "few information" to "little information"
- L109: indicate also the altitude of the sampling site in the main text
- L121: "site"
- L152 ad L163: "in-situ particle PH"
- L159: add "… to remove insoluble particles…"
- L222: replace "difference" with "pattern"
- L238: The sentence is too long. Consider starting a new sentence after the references.
- L246: consider replacing "precursors" to "compounds"
- L248: consider replacing "impressed" with "more significant"

- L258: "by wet deposition"
- L265: "by photochemical degradation"
- L278: delete 'would'
- L282: "at Mt. Tai"
- L289: consider changing "troposphere" to "atmosphere"
- L377: "linear"
- L447: either "ground" or "surface"; probably don't need to have both words
- Table1: is the upper end of RH at night 93% rather than 193%?
- Change the order of Fig. 6 and Fig. 5 as Fig. 6 is referred to before Fig. 5. Also it seems the next Figure that authors refer to is Fig. 8. Please use the figures in the same order they appear in the text.