

***Interactive comment on “Insights into the
secondary fraction of the organic aerosol in a
Mediterranean urban area: Marseille” by
I. El. Haddad et al.***

Anonymous Referee #2

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General:

This paper applies the marker-based SOA estimation to resolve the large fraction of SOA resulted from the CMB analysis of the measurements conducted at Marseille in the summer of 2008. Gas-phase measurements including VOC, O₃, and NO_x allow investigation of the formation mechanism of SOA from biogenic sources. The results are striking: in an urban site dominated by anthropogenic emissions, contemporary SOC is the major contributor to the SOA. The results cannot be explained by the observed biogenic precursors and the corresponding SOA tracers. Therefore, the problem re-

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mains unresolved, suggesting further analysis needs to be done in order to answer the question. Some comments are specified below:

Specific comments:

1. The major question is that it seems unlikely that the dominating primary source is motor vehicular emissions and the main SOA is from biogenic sources. Are there biogenic sources around the sampling site? It is mentioned in the companion paper that the AMS measurements were also conducted. A factor analysis of the AMS measurements is needed to further confirm the identified sources and SOA from the CMB model.
2. Section 4.1.2, first paragraph: the isoprene SOC marker showed high concentration at night, is this because of dark O₃ oxidation or because of transport?
3. Figure 5a, do the correlations of MACR vs. isoprene and MVK vs. isoprene show similar features as (MACR+MVK vs. isoprene)?
4. Page 21, the second paragraph: the low NO_x regime in the atmosphere is typically 0.5 ppbv NO_x, and in Surratt et al. (2006), NO_x concentration is < 1 ppb for the low NO_x. The lowest NO_x during the measurement period is 5 ppb, falling into the high NO_x regime. This should be noted in the high/low regime discussion although the proposed mechanism may still work.

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