ACP-2014-375: 2nd round author comments

We thank the Reviewers and Editor once more for their careful reading of our manuscript and their insightful and encouraging comments. In response, we have made the following changes:

Ref #1, comment1: Figure 2 key captions have been capitalized and corrected to correspond to the abbreviations used in the text and in Table 1.

Ref #1, comment 2: Pg 29 line 14 (Pg 18 line 33 of WORD document): “first principles” changed to “explicit chemical considerations”.

Ref #2, comment 1: *“With regard to my first comment, I still think it will be useful if the authors can provide some insights in the Discussion Section on how regional and global models can parameterize the multigenerational reaction products of both anthropogenic aromatics and alkanes.”* We have added the following text and references:

“Parameterizing SOA formation for routine modeling use is a complex task, and beyond the scope of this paper. Our results can, however, offer some insight. First, and as might be expected, our results illustrate that biogenic, aliphatic anthropogenic, and light-aromatic anthropogenic SOA precursors may be regarded as three distinct classes based on the timescales of resulting SOA mass development and the shapes of the product vapor pressure distributions. Within each of these broad groupings, there is considerable variability of product volatility and chemical characteristics, and GECKO-A has already been used to parameterize correlations for use in 3D models, e.g., between effective Henry’s Law constant and volatility (Hodzic et al., 2013 and 2014), between volatility and mean oxidation state (Aumont et al., 2012) and between carbon number and polarity (Chung et al., 2012). The specific insights given by these studies should contribute to mechanism parameterization efforts.

Chung, S. H., Lee-Taylor, J., Asher, W. E., Hodzic, A., Madronich, S., Aumont, B., , Pankow, J. F., and Barsanti, K. C., Development of a carbon number polarity grid secondary organic aerosol model with the use of Generator of Explicit Chemistry and Kinetics of Organic in the Atmosphere, poster presented at AGU Fall Meeting, San Francisco, CA, 3-7 December, A53O–0368, 2012.”

Ref #2, comment 2: Abstract, 5th sentence: We have added the words “multiday” and the phrase “especially those with relatively low carbon numbers (C4-15).”

Ref #2 comment 3: Table 2: typo “219” changed to “1.9”. Also, typo “9.5” changed to “9.2”. All other values have been checked and are correct.

Ref #2, comment 4: Pg 2 line 14: Added “et al.” to Tsigaridis reference.

Author addresses: Typo “CBRS” changed to “CNRS”

Section 2.2.2.: word “validated” changed to “tested”

Table 1: added “outflow T = 288K” to last line, for clarity. (This temperature was already stated in the text).