

Interactive comment on “Critical assessment of the current state of scientific knowledge, terminology, and research needs concerning the role of organic aerosols in the atmosphere, climate, and global change” by S. Fuzzi et al.

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Upon completion of the manuscript for this discussion paper, I realized that I would personally favor an alternative to the classification of organic aerosols by source type proposed in Table 1.

Since, however, I consider this subject worthy of public discussion and was originally not involved in the preparation of the manuscript section on organic aerosol sources

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(section 3), I did not want to delay the submission at the last moment by sparking off an internal discussion among the authors. Instead I would like to present my suggestions in this interactive comment. Depending on the outcome of the interactive public discussion, these or better alternatives could still be implemented upon revision of the manuscript for final publication in ACP.

From my point of view, it would be beneficial to define a more detailed classification of organic aerosols by source type and to use a more consistent and self-explanatory terminology than proposed in Table 1. In fact, this perspective had already been addressed in the text of manuscript section 3 (p. 11739, Q1: Definitions, (b) Classification of bio-fuel emissions, last sentence).

My proposal for the classification of organic aerosol particles and components by source type is outlined in a table on the following two pages of this interactive comment. In studies and inventories where it may be either not possible or not necessary to maintain the detailed classification outlined below, some of the classes could be easily and consistently combined, leading to similar classes as the ones proposed in the discussion paper (Table 1). For consistency and practical reasons, however, I would favor starting out with a detailed concept of classification, which can be simplified as appropriate, rather than the other way round.

Note that class 6.1 (Sea-spray POA) defined below could probably also be considered as a sub-set of class 1.1 (Biogenic POA), since most organic molecules and particles dissolved/dispersed in the ocean are likely of biogenic origin (including decaying biomass and the organic component of soils). Alternatively, one might consider the addition of complementary source categories for soil-derived organic matter (such as dispersed or evaporated and re-condensed humic-like substances) and reserve categories 1.1 and 1.2 for particles and components derived from living organisms or fresh biomass.

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Class	Designation	Particles/Components	Distinguishing Characteristics
1.1	Biogenic POA	Biological particles & compounds including whole organisms (e.g., bacteria), reproductive material (e.g., pollen, spores), fragments (e.g., plant waxes), and decaying biomass	Size, morphology; molecular and elemental markers (K, P); seasonality
1.2	Biogenic SOA	Products of chemical reactions of gaseous species emitted from biological organisms	Molecular markers; seasonality
2.1	Fossil Fuel Combustion POA	Products of fuel combustion (condensable at ambient temperature)	Molecular, elemental, and isotopic markers (^{14}C); seasonality
2.2	Fossil Fuel Combustion SOA	Products of chemical reactions of gaseous species emitted from fuel combustion	Molecular and isotopic markers (^{14}C); seasonality
3.1	Bio-Fuel Combustion POA	Products of bio-fuel combustion (condensable at ambient temperature)	Molecular and elemental markers (K); seasonality
3.2	Bio-Fuel Combustion SOA	Products of chemical reactions of gaseous species emitted from bio-fuel combustion	Molecular markers; seasonality
4.1	Industrial POA	Products of industrial/technical processes other than fuel combustion (condensable at ambient temperature)	Molecular and elemental markers (trace metals)

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4.2	Industrial SOA	Products of chemical reactions of gaseous species emitted from industrial/technical processes other than fuel combustion	Molecular markers
5.1	Open biomass burning POA	Products of open biomass burning due to natural fires and land-use practices	Molecular and elemental markers (K); seasonality
5.2	Open biomass burning SOA	Products of chemical reactions of gaseous species emitted upon open biomass burning	Molecular markers; seasonality
6.1	Sea-spray POA	Dissolved organic compounds and surfactants dispersed in the sea spray process	Size-segregated composition, surface tension

The last column of the above table has just been adapted from Table 1 in the discussion paper and may still require some complementation and refinement.

Apart from the issue of source classification, the color shading in Figs. 1 and 4 got distorted upon manuscript production and was unfortunately not corrected upon proof-reading. It will be corrected upon revision of the manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 11729, 2005.

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