

Interactive comment on “Volatility of secondary organic aerosol during OH radical induced ageing” by K. Salo et al.

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Three quantified products from the alpha-pinene oxidation, pinonic acid, pinic acid and 3-methyl-1,2,3-butanetricarboxylic acid (MBTCA) were used to probe the processes influencing aerosol volatility, which is certainly a valid strategy. Some background information should be provided in this manuscript why MBTCA has been included. This could best be done in the introduction. Unlike pinonic and pinic acids, MBTCA is not a well-known alpha-pinene secondary organic aerosol (SOA) product but has only been recently structurally elucidated and proposed as a suitable terpene SOA tracer (Szmigielski et al., 2007). A reference to the latter study and some related relevant studies (for which I refer to Zhang et al., 2010) would be appropriate. A search on the Web-of-Science with “3-methyl-1,2,3-butanetricarboxylic acid” as topic only gives 6

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references, the first one being Szmigielski et al. (2007), much less than for “pinic acid” and “pinonic acid” for which 91 and 107 references were found, respectively, showing that MBTCA is indeed not well known. I suggest that the authors add a few lines in the introduction and explain why MBTCA is monitored, as was, for example, nicely done in the recent study by Zhang et al. (2010), who measured pinic and pinonic acids and MBTCA in ambient fine aerosol collected over a whole year in Mainz, Germany, and stated in their introduction:

“Pinic acid as a dicarboxylic acid and pinonic acid as an oxocarboxylic acid are major products of the ozonolysis or OH-initiated oxidation of pinene (here and below pinene stands for both alpha- and beta-pinene) (Atkinson and Arey, 2003; Hatakeyama et al., 1989, 1991; Yu et al., 1999a). Further reaction of the initial oxidation products of pinene leads to highly oxidized, acyclic, polar compounds (3-hydroxyglutaric acid and 3-methyl-1,2,3-butanetricarboxylic acid, 3-MBTCA) (Szmigielski et al., 2007; Kourtchev et al., 2009; Jaoui et al., 2005). 3-MBTCA is formed by OH-initiated oxidation of cis-pinonic acid (Szmigielski et al., 2007) and was first detected in aerosol samples from Amazonia and Belgium (Kubatova et al., 2000, 2002).”

Refs.:

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- Zhang, Y. Y., Muller, L., Winterhalter, R., Moortgat, G. K., Hoffmann, T., and Pöschl, U, Seasonal cycle and temperature dependence of pinene oxidation products, dicarboxylic acids and nitrophenols in fine and coarse air particulate matter, *Atmos. Chem. Phys.*, 10, 7859–7873, 2010.

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