

Interactive comment on “Molecular understanding of the suppression of new-particle formation by isoprene” by Martin Heinritzi et al.

Anonymous Referee #2

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This paper investigates the molecular mechanisms for the suppression of new particle formation from monoterpenes by isoprene. The authors found that isoprene significantly suppresses the nucleation and the growth of the smallest particles from α -pinene oxidation, and showed that this suppression is mainly a result of interference of isoprene oxidation on the production of α -pinene HOM dimers, which are the major ELVOCs driving particle nucleation and early growth. This paper is nicely written and provide important molecular constraints on new particle formation in isoprene-rich regions. I recommend the publication of the paper in ACP after the authors address a few minor comments detailed below.

L101-102: The recent study by Berndt et al. (ES&T, 2018) that was cited in this paper reported the interactions between isoprene- and α -pinene-derived peroxy radi-

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cals in α -pinene/isoprene mixed systems. More recently, the Nature paper by McFiggans et al. (2019) that was also cited in the paper clearly showed that the concurrent isoprene oxidation largely scavenges α -pinene HOM dimers, in addition to scavenging OH radicals, leading to reduced SOA formation from α -pinene/isoprene mixtures. Therefore, the statement “the interaction of isoprene and monoterpene oxidation chemistry. . . .remains unclear” needs to be rephrased.

L270-280: A discussion of the relevant findings in McFiggans et al. (2019) should be included in this paragraph.

L295: “ α -pinene isoprene system” \rightarrow “ α -pinene/isoprene system”.

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