

Formation of highly oxidized multifunctional organic compounds from anthropogenic volatile organic compounds

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Recent studies have shown that highly oxidized multifunctional organic compounds (HOMs) from biogenic volatile organic compounds are important for new particle formation and early particle growth (e.g., Ehn et al., 2014). The formation mechanism has extensively been studied for biogenic precursors like alpha-pinene and was shown to proceed through an initial reaction with either OH radicals or ozone followed by radical propagation in a mechanism that involves O₂ attack and hydrogen abstraction (Crouse et al., 2013). While the same processes can be expected for anthropogenic volatile organic compounds (AVOC), few studies have investigated these so far. Here we present the formation of HOMs from a variety of aromatic compounds after reaction with OH. All the compounds analyzed show HOM formation. AVOC could therefore play an important role in new particle formation events that have been detected in urban areas.

References

- Crouse, J.D. et al., Autoxidation of organic compounds in the atmosphere. *J. Phys.Chem. Lett.* 4, 3513–3520 (2013).
- Ehn, M., et al. A large source of low-volatility secondary organic aerosol, *Nature* 506, 476–479 (2014).