



## **Secondary organic aerosol formation from boreal tree emissions**

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Plant emissions are a major source of volatile organic compounds (VOCs) in the troposphere. Atmospheric oxidation of these VOCs in particular that of mono- and sesquiterpenes leads to low volatile products that form secondary organic aerosols (SOA). We investigated SOA formation from the mixture of VOC emitted from plants and compared these results to those obtained using  $\alpha$ -pinene as single VOC.

The experiments were performed using plants located under well defined conditions in a plant chamber. A fraction of the air from the plant chamber was transferred to a reaction chamber and SOA formation from the VOCs introduced into the reaction chamber was initiated by UV-photolysis of ozone. The maximum SOA volume produced during VOC oxidation was used as the quantity determining the SOA formation potential.

Spruce, pine and birch were used as model plants. Changing temperature in the plant chamber led to changes of VOC emissions and furthermore, to changes of the maximum SOA volumes in the reaction chamber. Plots of maximum SOA volumes versus the total amount of carbon fed into the reaction chamber led to approximately linear relationships. The intercepts of these plots were seen as threshold for SOA formation. It was observed that this threshold was lower for the mixture of VOCs emitted from spruce, pine, and birch than for  $\alpha$ -pinene as single compound. We therefore conclude that the threshold for SOA formation from real plant mixtures may be much lower than the threshold obtained from laboratory experiments that were focussed on single VOCs.