

Investigation of primary and secondary aerosols from wood combustion with a high resolution time of flight aerosol mass spectrometer

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Primary emissions of two different types of modern wood burners were investigated: an automatic pellet burner and a logwood burner. The logwood burner produced high mass concentrations of organics which were the dominant measured aerosol chemical species during the entire burning cycle. Automatic burners are known for their almost complete combustion and low organic particle emissions (*Oser et al.* (2001)). AMS Measurements showed that during stable burning the mass fraction of organics in the aerosol is low. However, during the starting phase, where particle emissions were high, the main aerosol chemical constituent is organic.

Mass fragments at m/z 60, 73 and 137 were recently identified as markers for primary particle emissions from wood burning (Alfarra et al., (2007), Weimer et al., (2008)). To characterize the aging of the primary organic aerosol and these markers and to investigate the formation of secondary organic aerosols from wood burning a series of photo-oxidation experiments have been conducted in the PSI smog chamber. Emissions from a log wood burner were sampled and injected into the 27m³ smog chamber. The first results showed that the formation of secondary organic aerosol starts almost instantly when the lamps are switched on and organic aerosol mass concentrations reach a maximum mass after 1 to 3.5 hours. Additional preliminary results will be shown during the presentation.

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