



Laboratory studies on radical reactions of atmospheric relevant polyols in aqueous solution

D. Hoffmann and H. Herrmann

Leibniz-Institut für Troposphärenforschung, Leipzig, Germany

E-mail: hoffmann@tropos.de

Levoglucosan and other polyols (e.g., Erythritol, Arabitol, Mannitol) can represent an important fraction of the water soluble organic carbon (WSOC) in atmospheric particles. The main source for Levoglucosan is the pyrolysis of cellulose. This makes Levoglucosan an important tracer compound for contribution of biomass burning processes to the particle mass. The other investigated compounds are emitted from different biogenic sources. The source specificity makes the investigated compounds, and in particular Levoglucosan, interesting for source apportionment studies. However, little is known about the atmospheric stability and degradation products of these polar and water soluble compounds. Especially the reactivity of these compounds towards atmospheric radicals in the aqueous phase was not systematically investigated so far.

Using different thermostated laser-photolysis-long-path-absorption (LP-LPA) set-ups, reactions of atmospheric radicals (OH , NO_3 and SO_4^-) with Levoglucosan, Erythritol, Arabitol and Mannitol in aqueous solution were studied at $T = 298 \text{ K}$. Furthermore, all kinetic measurements were carried out as a function of the temperature. During these experiments the temperature of the measurement solution was varied between $278 \leq T [\text{K}] \leq 318$. The kinetic data and activation parameters obtained will be presented and discussed in this contribution. Lifetimes of the studied tracer compounds and implications to source apportionment studies will be discussed.