



Study of the reactivity of the isobutyl nitrate in the aqueous phase of the atmosphere: Development of a methodology for studying the fate of polyfunctional organic nitrates

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Organic Nitrates (ON) are relevant compounds in the atmosphere as they are involved in the NO_x spread in the troposphere, therefore, related to the O_3 and SOA production. For this reason, the study of the reactivity of ON has a huge importance for achieving proper atmospheric pollutants predictions. Nonetheless, up to date the studies of these compounds have only focused on the fate of alkyl nitrates, and their reactivity has been studied only in the gas phase whereas most of the ON are highly functionalized with a relevant presence in condensed phases.

The present work deals with the study the reactivity of several ON within the condensed phase, and in particular, in the aqueous phase. We will present our methodology, including direct photolysis and OH-oxidation, validated with a commercial alkyl nitrate in the aqueous phase. Furthermore, we have elucidated the mechanisms which take place in the reactions by identifying the formed reaction products and also the first step radicals formed using EPR, a technique which allows us to detect radicals in situ and that has never been employed in this kind of experiments. After validation, this procedure is applied on more functionalized and atmospherically relevant ON such as those derived from isoprene.