Gas-phase OH radical reaction of dimethyl phthalate

M. Antiñolo[1,2], M. T. Baeza-Romero[1,2], E. Jiménez[3,4], J. Albaladejo[3,4]

[1] *Escuela de Ingeniería Industrial y Aeroespacial, Departamento de Química Física, Universidad de Castilla-La Mancha, Spain.*

[2] *Instituto de Nanociencia, Nanotecnología y Materiales Moleculares, Universidad de Castilla-La Mancha, Spain.*

[3] *Facultad de Ciencias y Tecnologías Químicas, Departamento de Química Física, Universidad de Castilla-La Mancha, Spain.*

[4] *Instituto de Investigación en Combustión y Contaminación Atmosférica, Universidad de Castilla-La Mancha, Spain*

maria.antinolo@uclm.es

Phthalates or phthalate esters are a family of synthetic chemical compounds with a widespread use, ranging from consumer to industrial products. One of their main uses is as plasticizers or to make plastics more flexible or durable. Some of them have been shown to affect human health and have been detected mostly indoors in the gas phase, as part of particulate matter or on different surfaces in the form of dust [1-4]. Despite they can be found almost everywhere, there are scarce studies on their gas-phase reactivity with tropospheric oxidants such as ozone (O_3) or hydroxyl (OH) radicals [5-7].

In this work, we present, for the first time, the kinetics of the gas-phase reaction of dimethyl phthalate (DMP) with OH radicals, which have been found not to be in negligible concentrations indoors. Experiments have been performed in a smog chamber at 298 K and 760 Torr of air using a Proton Transfer-Time of Flight-Mass Spectrometer (PTR-ToF-MS) as detection method. A relative kinetic method was used in which isoprene and ethanol were used as reference compounds. The impact of DMP on the indoor air quality will be discussed considering its atmospheric lifetime related to OH radical.

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