

Review of “On the similarities and differences between the products of oxidation of hydrocarbons under simulated atmospheric conditions and cool flames” by Roland Benoit et al., (MS No.: acp-2020-1070).

Based on high resolution mass spectrometry (Orbitrap) analysis, the authors of this study compared the molecular characteristics of oxidation products of limonene in a jet-stirred reactor (JSR) to oxidation products of limonene by $\cdot\text{OH}$ and/or ozone under tropospheric relevant conditions in literature. The authors found that 771 of 1600 molecular formulae are common to both oxidation modes, while 462 molecular formulae are obtained solely by $\cdot\text{OH}$ and/or ozone oxidation, and 367 are produced in JCR experiments. On the basis of further analysis by ultra-high-pressure liquid chromatography (UHPLC), the authors investigated the potential occurrence of the Waddington mechanism and Korcek mechanism during the oxidation process of limonene in JSR. Even though the experiments are done carefully and the results are illustrated detailly, I am sceptical about the suitability and subsequent implications of the comparison of limonene oxidation under aforementioned conditions. It is significantly unclear about how relevant/representative of the applied/selected fuel lean condition to the real ambient conditions and whether the composition of the oxidation products in JCR largely dependent on the temperatures and limonene/ O_2 concentration ratios. Finally, the manuscript is not written well, without presenting the novelty and atmospheric implications clearly. Therefore, I think the topic of this study fits better a combustion related journal (e.g., Combust. Flame.) rather than ACP.