

General comments:

This article "Mechanistic insight into the kinetic fragmentation of Norpinonic Acid in the gas phase: An experimental and DFT study" written by Kurzydym et al. studied the norpinonic acid (important α -pinene oxidation product) anionic fragmentation pathway in the gas phase, and the exact ion fragment structures were identified using the secondary-order mass spectrum (MS/MS) recorded during energy resolved collision-induced dissociation mass spectrometry experiments (ER-CID). The research results are helpful for us to understand better about the possible chemical structures from the fragmentation of norpinonic acid. However, I feel that the significance of the research is not well explained. How should we link the experimental results to the current atmospheric chemistry? Will the fragmentation of norpinonic acid in the gas phase have much effect on the natural atmospheric aerosol formation? Overall, the research contents are suitable for ACP readers, but some revisions should be made to the main text before this paper can be published.

Other comments:

1. It is not proper to use the abbreviation "DFT" in the title directly. Also, I haven't seen any explanation about "DFT" in the main text.
2. Line 80: More details should be described in the main text, i.e., what is the main mechanism used for the synthesis of cis-norpinonic acid, what is the purity of the synthesized product? Why the trans-norpinonic acid is not used here?
3. Lines 105-106: The description of the calculation is quite simple, could you add some more details about the Gaussian 09 suite of programs and the Cartesian coordinates of the initial geometries here?
4. Line 223-225: the variations in the averaged experimental fragmentation energies are quite large (with large averaged standard deviation), how will these uncertainties affect the results and discussions in Sect. 3.2?
5. Lines 227 and 255: please keep the table format the same.
6. In the conclusion section, please summarise more on the experimental results and their significance rather than the experimental method and procedures.