CHARGE THE RADICALS OR LET THEM GO! : THE ISOLATION AND DIRECT OBSERVATION OF THE REACTIONS OF 1-ADAMANTYL AND OTHER BRIDGEHEAD RADICALS BY MASS SPECTROMETRY

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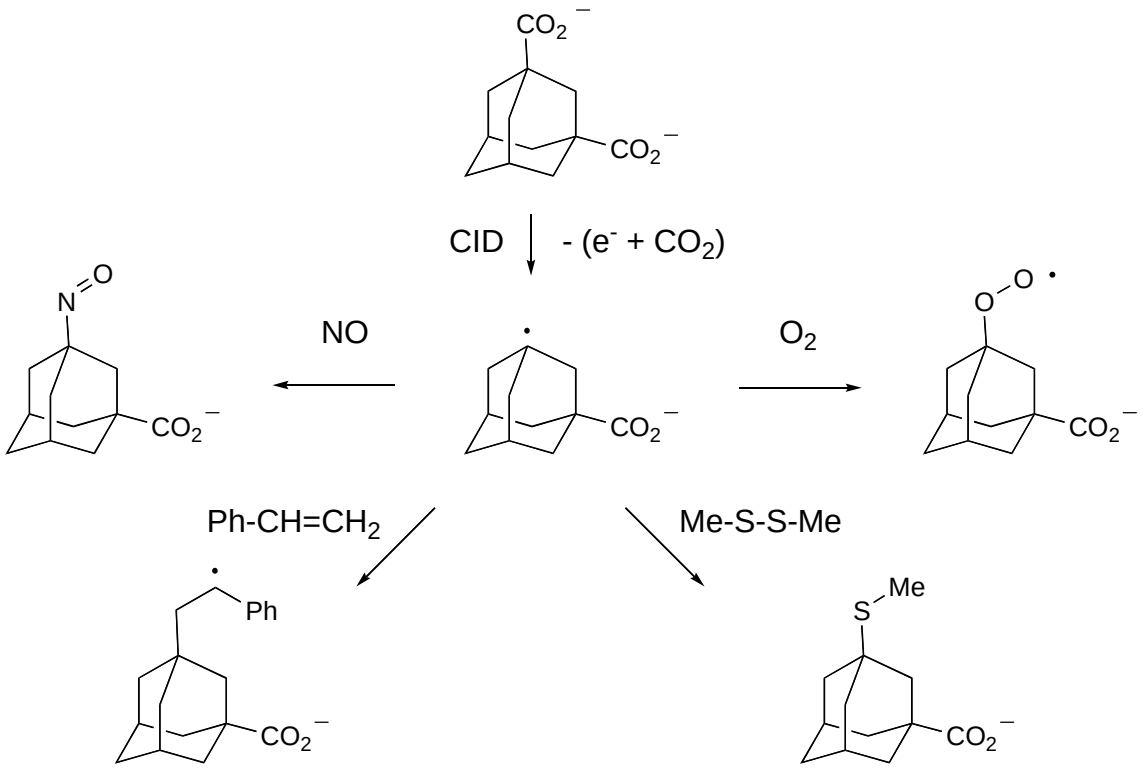
A series of bridgehead alkyl radical anions have been synthesized from their respective dicarboxylate anions by collisionally-induced oxidative decarboxylation in an electrospray ion-trap mass spectrometer. Computational chemistry reveals that such distonic radical ion species closely mimic the reactivity of analogous neutral radicals. This is the first study in which alkyl radicals have been trapped in the gas phase and their reactions observed in real time. Consequently, this approach allows the possibility to characterize and study previously evasive reactive intermediates through *m/z* and CID fragmentation patterns. Classical reactions including radical-radical combination, substitution and addition have been observed upon treatment of the radicals with neutral small molecules. Examples of these reactions are illustrated below.



This presentation will cover the generation, isolation and reactions of distonic radical ions. Also discussed will be the different reactivity of other bridgehead radicals and alkyl peroxyl radicals.