



Matrix Isolation and Solvation studies of Diphenylmethyl radical

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Keywords

Matrix isolation, Ice matrix, Diphenylmethyl radical, Benzhydryl cation

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Introduction

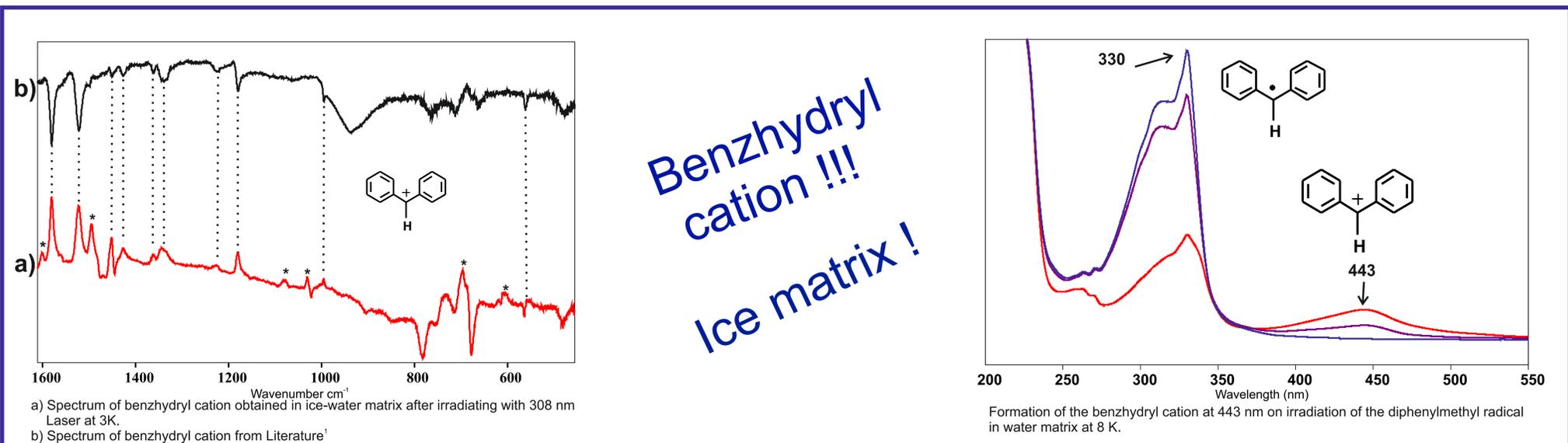
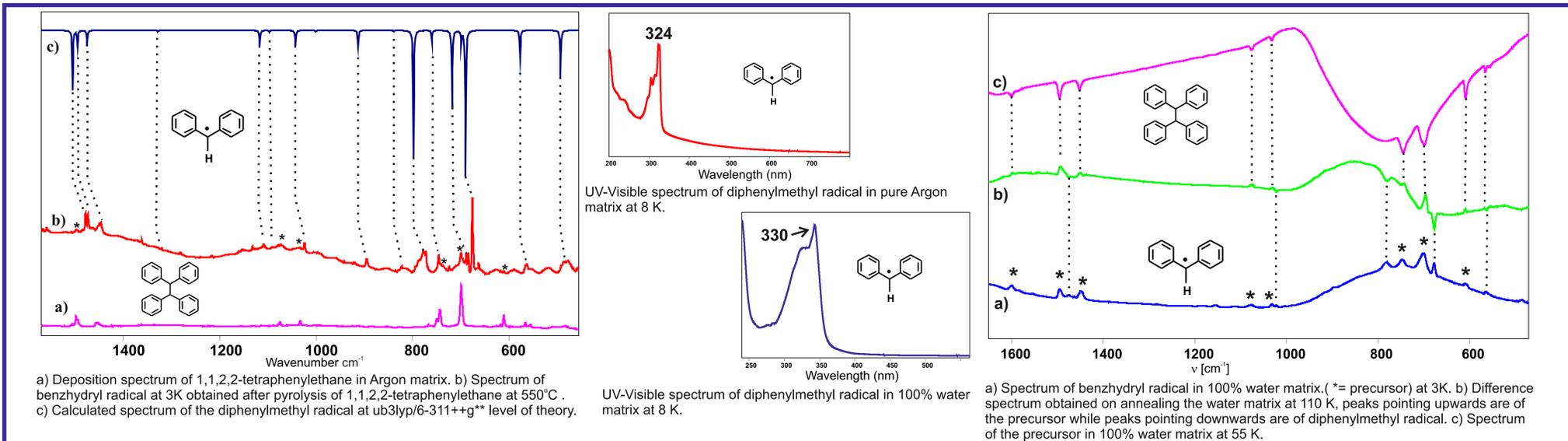
Reactions of radicals in water is one of the crucial steps in all the biological systems. Different types of interactions of the radicals with water and the subsequent species formed have been of great interest to the scientific community. The interactions and the species formed are extremely short-lived which makes it difficult to detect them spectroscopically. Hence the formation of these species is done at extremely low temperatures of 3 K- 10 K.

The diphenylmethyl radical was successfully isolated in good yields in Ice matrix at 3 K. Subsequent irradiation with UV light leads to the generation of the benzhydryl cation which is stable enough to be detected spectroscopically. Further irradiation of the cation regenerates the precursor (1,1,2,2-tetraphenylethane) itself. Further studies of this radical and its interaction with water is still in progress.

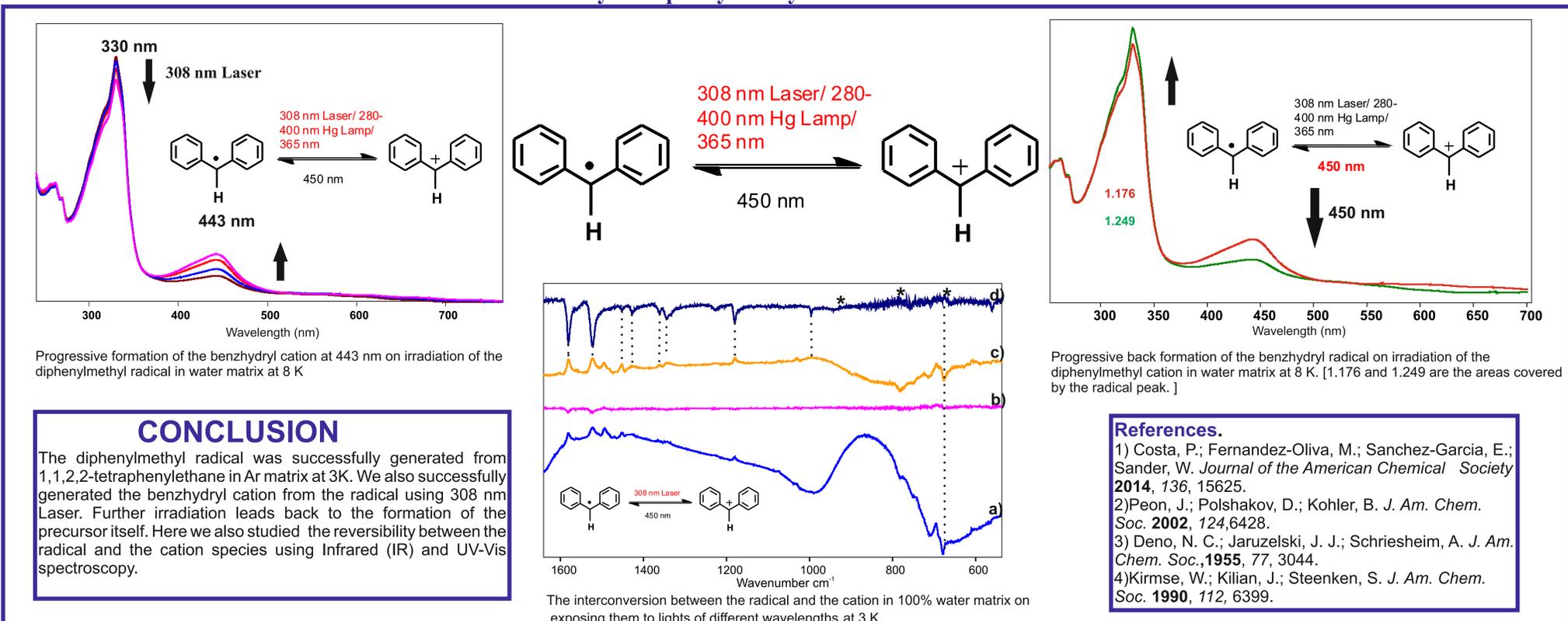
Here the interactions formed by the radical and the cation in 100% water matrix, are thoroughly studied to know the form of interaction and the mechanistic pathway undertaken. We also performed Density Function Theory (DFT) calculations to confirm the formation of the diphenylmethyl radical and the benzhydryl cation.

Results and Discussion.

Matrix Isolation of Diphenylmethyl radical in Argon matrix and Photochemistry



Photochemistry of Diphenylmethyl radical in 100% water matrix



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