The non-classical structure of the 2-norbornyl cation \( \text{C}_7\text{H}_{11}^+ \) which was at the center of “the most heated chemical controversy of our time” has been observed in the condensed phase and recently using X-ray crystallography. However, no gas phase vibrational spectrum has been collected.

The \( \text{C}_7\text{H}_{11}^+ \) cation is produced via \( \text{H}_3^+ \) protonation of norbornene by pulsed discharge in a supersonic expansion of \( \text{H}_2/\text{Ar} \). Ions are mass-selected and probed using infrared photodissociation spectroscopy. Due to high exothermicity, protonation via \( \text{H}_3^+ \) leads to a structural isomerization to the global minimum structure 1,3-dimethylcyclopentenyl (DMCP\(^+\)). Experiments are currently being conducted to find softer protonation techniques that could lead to the authentic 2-norbornyl cation.

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^{Schleyer, P. V. R. et. al.; Stable Carbocation Chemistry, John Wiley & Sons, Inc.; New York, 1997, Chapter 2}