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## **【638】 Towards detection of $\text{FeH}^+$ in the interstellar medium: infrared photodissociation spectroscopy of $\text{Ar}_2\text{FeH}^+$**

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The iron hydride cation ( $\text{FeH}^+$ ) is believed to be an abundant transition metal compound in the interstellar medium (ISM). Due to the lack of laboratory data, it has not been identified in spectral observations. We performed infrared multiple photon dissociation (IRMPD) spectroscopy of  $\text{FeH}^+$  tagged with two argon atoms. The Fe-H stretch in  $\text{Ar}_2\text{FeH}^+$  is observed at  $1854\text{ cm}^{-1}$ , and two weaker combination bands appear around  $2000\text{ cm}^{-1}$  and  $2080\text{ cm}^{-1}$ , respectively, in agreement with quantum chemical calculations. The Ar-Fe-Ar bending mode is populated at the temperature of the experiment, most likely causing the observed broadening of the Fe-H stretch.

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