

The Temperature Dependent VUV Spectra Shifts of CO Ices

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Ice photodesorption has been considered as a non-thermal process, which contributes the abundance of gas-phase molecules toward the cold interstellar regions. In this work VUV absorption spectra of carbon monoxide ices were measured to evaluate the possible link between the structure and the photodesorption yield of carbon monoxide ice[1]. The temperature dependent VUV spectral shifts (few hundred wavenumbers) were observed that can be reproduced by a simple electrostatic model base on Stark effect on a hole and electron residing several nm wavenumbers apart, identifying the presence of Wannier-Mott excitons[2]. The spontelectric effect in CO simultaneously explains the long-standing enigma of the sensitivity of vacuum ultraviolet spectra to the deposition temperature.

References

- [1] G. M. Muñoz Caro, Y.-J. Chen, S. Aparicio et al., *A&A*, 589, A19, 2016
- [2] Y.-J. Chen, G. M. Muñoz Caro, S. Aparicio et al., *Phys. Rev. Lett.*, 119, 157703, 2017