

# Measurements of activation energies for diffusion of hydrogen atom on pure CO solid

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Diffusion of hydrogen atom on dust grains is an elementary process leading to formation of interstellar H<sub>2</sub> and some hydrogenated molecules like formaldehyde and methanol and thus desirable to be understood. We investigated the diffusion and adsorption of hydrogen atoms on pure CO solid as an analog of dust surface observed towards some cold regions. Using a combination of photostimulated desorption and resonance enhanced multiphoton ionization methods [1-3] to detect hydrogen atoms directly, the relative adsorption probabilities and diffusion of hydrogen and deuterium atoms are monitored on pure CO solid at 8, 12 and 15 K. Difference between hydrogen and deuterium atoms were little observed in diffusion coefficients, indicating the diffusion is dominated by thermal hopping. The activation energies controlling H-atom diffusion were found to depend on the surface temperature. In addition, competition among diffusion, H<sub>2</sub> formation, CO hydrogenation on pure CO solid is discussed.

## References:

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