

HELIUM AND HYDROGEN INDUCED ROTATIONAL RELAXATION OF H₂CO OBSERVED AT TEMPERATURES OF THE INTERSTELLAR MEDIUM

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We have performed pressure broadening and time resolved double resonance studies on three rotational transitions ($2_{12} \leftarrow 1_{11}$, $2_{11} \leftarrow 1_{10}$, and $3_{13} \leftarrow 2_{12}$) of formaldehyde (H₂CO) in collision with helium and hydrogen at low temperatures ($T \leq 16$ K). This was achieved by applying the collisional cooling method. The purpose of this study was to compare laboratory measurements with the theory used to explain the anomalous absorption of interstellar formaldehyde against the 2.7 K background.^a We can confirm this prediction as far as it constitutes a model based on H₂CO - He collisions. However, we observe significantly different pressure broadening cross sections for H₂CO - H₂ collisions which raises the question as to whether a simple transfer from helium to hydrogen as collision partner can be made.

^aB.J. Garrison, W.A. Lester Jr., and W.H. Miller, *J. Chem. Phys.* **65**, 2193-2200 (1976)