HCCO
IN INTERSTELLAR SPACE

Divya Raj • David Nallapu • Simran Srivastava • Anushree Avasthi • Bhavya Aggarwal

Structure

The ketenyl radical(HCCO) has a planar structure with a practically linear CCO backbone and the H atom lying out of the linear axis. The radical has a $^2A''$ ground electronic state and a complex rotational structure whose N_{K_a,K_c} levels split in a fine (electronic spin-rotation interaction) and hyperfine (H nuclear spin) structure described by the quantum numbers J and F, respectively.

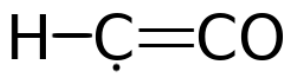

Figure 1: The Ketenyl readical, Lewis structure

Interstellar Sources of Detection

HCCO was first detected in the starless core Lupus-1A and the molecular cloud L483.[1]

Observation Techniques

The observation which led to the discovery of the molecule in interstellar space were ground based and were carried out using the IRAM 30m millimeter radio telescope, located in Veleta, Granada Province, Spain.[2]
The observations were made in selected frequency ranges from 83 to 105 GHz, which fall under the Ultra high frequency range.[3]

References

[1] Marcelino Agndez, Jos Cernicharo, and Michel Gulin, *Discovery of interstellar ketenyl (HCCO), a surprisingly abundant radical*. April, 2015.

[2] Wikipedia - IRAM 30m telescope

[3] Wikipedia - Electromagnetic Spectrum