Ortho-Para Ratio of Cyclic-C_3H_2 in Dark Cloud Cores.

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Cyclic-C_3H_2 is know to be a ubiquitous molecule in interstellar space. It has two equivalent hydrogen atoms, so that ortho (O) and para (P) modification exist. We have observed spectra of *c*-C_3H_2 in five cloud cores of TMC-1 using the Nobeyama 45 m radio telescope. Total of eight pure rotational transitions were observed. From the observed intensities, the density of H_2 molecules and the fractional abundance of ortho and para species of *c*-C_3H_2 were determined using the so-called LVG model. The O/P abundance ratio of *c*-C_3H_2 obtained from the calculated abundances is found to be 1.5 - 2 in all the observed cloud cores, although both the statistical ratio and the thermal equilibrium ratio at the cloud temperature of 10K are 3. The deviation of the O/P ratio of *c*-C_3H_2 from 3 must originate in the conservation of nuclear spin states during chemical reactions. It was also found that the O/P abundance ratio of *c*-C_3H_2 is strongly correlated to the age of the cloud cores; the O/P abundance ratio in the regions of early chemical stage is lower than that in the regions of later stage. Possible mechanisms of production and destruction of *c*-C_3H_2 will be discussed in order to interpret the observed O/P abundance ratio of *c*-C_3H_2 in various cores.