^{13}C-METHYL FORMATE IN ORION-KL: ALMA OBSERVATIONS AND SPECTROSCOPIC CHARACTERIZATION

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Determination of elemental isotopic ratios is valuable for understanding the chemical evolution of interstellar material. Until now the ^{12}C/^{13}C ratio has predominantly been measured in simple species such as CO, CN and H_2CO and, becomes larger with increasing distance from the Galactic Center. We have investigated the carbon isotopic ratio for methyl formate $HCOOCH_3$, and its isotopologues $H^{13}COOCH_3$ and $HCOO^{13}CH_3$ addressing the issue whether the ^{12}C/^{13}C ratio is the same for both simple and large molecules. Using ALMA science verification observations of Orion-KL and the spectroscopic characterization of the complex $H^{13}COOCH_3$ and $HCOO^{13}CH_3$ species that we have performed, we have 1) confirmed the detection of the ^{13}C-methyl formate species in Orion-KL and, 2) image for the first time their spatial distribution. I will present some of these results. In particular, our analysis shows that the ^{12}C/^{13}C isotope ratio in methyl formate toward the Compact Ridge and Hot Core-SW components that are associated with Orion-KL are, for both the ^{13}C-methyl formate isotopologues, commensurate with the well-known ^{12}C/^{13}C ratio of the simple species CO. Our findings suggest that grain surface chemistry very likely prevails in the formation of methyl formate main and ^{13}C isotopologues.