

PROBING THE CHEMICAL COMPLEXITY OF HIGH MASS STAR FORMING REGIONS

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Recent 1 mm CARMA observations of Orion-KL have shown that the known chemical differentiation in the region is much more complex than previously thought. The maps from Friedel & Snyder (2008)^b show that both the nitrogen-rich hot core and oxygen-rich compact ridge regions are comprised of many smaller components, which is not a surprising result. However, the maps of acetone [(CH₃)₂CO] show that it is not co-spatial with other large oxygen-bearing species. Instead, acetone is only present in the smaller, partially-resolved regions where both large nitrogen-bearing species [e.g. ethyl cyanide, C₂H₅CN] and large oxygen-bearing species [e.g. dimethyl ether, (CH₃)₂O] overlap. This unexpected result cannot be explained by any of the current chemical models. In order to shed more light on this we have conducted additional high-resolution CARMA 3 mm observations of numerous complex molecules toward Orion-KL. We will present the results of these observations. We will also discuss the implications of these results in terms of the likely mechanisms for complex molecule formation.

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