Early warm-up phase chemistry towards a sample of emerging hot cores

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During star formation the molecular gas undergoes significant chemical evolution leading to a molecular richness at the emergence of hot cores. The chemical formation pathways even for simpler molecules are debated. Using a spectral survey between 159 GHz and 374 GHz with the APEX telescope, we investigated a sample of 6 massive clumps dominated by a single collapsing massive object down to 400 au scales. In all 6 sources of the sample, on average of 40 species were found. We located these species within the envelope. While some objects exhibit a clear structure with a well-defined warm gas phase, some remain mostly cold with warm gas traced only by methanol and methyl cyanide. The molecular composition of the sample is remarkably similar: their molecular content is composed of the simplest molecules and the most complex ones in the cold component of envelope for all our objects. However, some differences in the molecular emission are found in the deuterated molecules, S-bearing molecules, and the COMs. Towards the warm component, the comparison of the relative molecular abundances shows an emerging warm gas phase with high molecular abundances for dimethyl ether, methyl formate, formamide, and the cyanides. Finally in our objects, we found similar relative abundances for O-bearing molecules relative to CH_3OCH_3 while cyanides exhibit remarkably higher abundances relative to CH_3CN compared to hot corinos.