Poster: Chemistry on the high-mass protostellar clump IRAS 16562-3959

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The high-mass molecular clump IRAS 16562-3959 hosts at least one high-mass young stellar object (HMYSO) which is actively accreting and associated with an hypercompact HII region. Line observations taken with ALMA at 3 mm at 1.7 arcsec (0.014 pc at 1.7 kpc) resolution show emission from 22 molecular species (34 isotopologues and isotopomers). Emission of high temperature (T > 100 K) complex organic molecules (COMs) like CH3OH, C2H5CN, and CH3OCH3 arises from a hot core located in the vicinities of the central HMYSO. Besides the sulfur oxides, no other species evidence the presence of the previously detected rotating core. On a larger scale, we were able to separate molecules in two groups according to their extended emission morphology: one group gathers molecules whose origin is possibly shocked gas and ice+dust sputtering (e.g., sulfuretted, HNCO, CH3OH, H2CCO, CH3CHO), while the other is more related with (cold) gas phase chemistry (e.g., CCH, HCN, HNC, CH3CCH). In addition, we detect deuterated ammonia (NH2D) mostly in the outskirts of IRAS 165623959 and associated with near infrared dark globules, likely gaseous remnants of the clumps prestellar phase. The spatial distribution of molecules in IRAS 165623959 demonstrates that in protostellar clumps, chemical tracers associated with different evolutionary stages — starless to hot cores/HII regions — simultaneously coexist .

Cores and embedded objects