

Astrochemistry in the Early Universe

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Abstract

Chemistry plays a critical role in controlling the formation of the first objects through cooling the clouds as they collapse. The radiation emitted in this cooling will also be the most precise diagnostics of the physical conditions of these clouds. In the first objects the cooling was likely dominated by molecular hydrogen, H_2 . We have computed state to state cross sections for H on H_2 collisions. This will improve our understanding of cooling in the early universe, and line emission in the formation of the first objects. I will present an overview of that chemistry including these new calculations of H on H_2 collision rates.

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