Understanding Non-Covalent Interactions via Mass-Selective Laser Spectroscopy in Jets

José A. Fernández

The study of molecular aggregation is decades old. The intermolecular forces that govern such process are small in module but big in importance, as they model the world around us. They also control key processes in the cell, such as docking or protein folding. For many years, there has been an intense activity in the field of spectroscopy in jets to characterize molecular aggregates of different nature and increasing size, to understand the above-mentioned process. The use of jets is required to create the necessary conditions for the molecules to aggregate. A cold environment ensures the survival of the species created during the cooling process at the exit of the valve's nozzle. Then, several spectroscopic techniques have been developed to extract physical observables from the system, which are afterwards compared with high-level quantum-mechanical calculations, but the most popular ones are laser spectroscopy with mass-resolved detection and microwave spectroscopy. Both offer complementary data over the same systems. Using this methodology, many systems have been characterized. Here, we will review some of them and the lessons learned from their study, trying to create general rules of broad application.