

ROTATIONAL SPECTROSCOPY OF REACTIVE SPECIES IN SUPPORT OF THE DETECTION OF INTERSTELLAR MOLECULES

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Interstellar molecules are often highly reactive species, which are unstable under terrestrial conditions, such as radicals, ions and unsaturated carbon chains. Their detection in space is usually based on the astronomical observation of their rotational fingerprints. However, laboratory investigations have to face the issue of efficiently producing these molecules and preserving them during rotational spectroscopy measurements. A general approach for producing and investigating unstable/reactive species is presented by means of selected case-study molecules. The overall strategy starts from quantum-chemical calculations that aim at obtaining accurate predictions of the missing spectroscopic information required to guide spectral analysis and assignment. Rotational spectra of these species are then recorded by exploiting the approach mentioned above, and their subsequent analysis leads to accurate spectroscopic parameters. These are then used for setting up accurate line catalogs for astronomical searches.