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| Title: | Matrix Isolation Spectroscopy—A Window to Molecular Processes |
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| Abstract: | Matrix isolation spectroscopy is a popular technique that has been used for the last six decades or so to study molecular conformations, weak intermolecular interactions, transient species, and species related to high temperature chemistry. In this technique, the species of interest is immobilized in a rigid inert gas matrix at cryogenic temperatures (~10K). The trapped species are then probed using a variety of spectroscopic techniques, the most popular being infrared spectroscopy. Other techniques, such as electron paramagnetic resonance, UV-visible absorption, and fluorescence spectroscopy, have also been used. One of the strong points of this technique is its ability to trap local minima that molecular beam gas phase studies usually do not. Hence a wider perspective of the potential surface can be obtained. The experimental data from matrix isolation spectroscopy have been well supported by computations. It is the interplay between experimental and computational techniques, which has made the matrix isolation technique very powerful. This chapter describes the technique, the many advances it has seen over the years, and case studies to highlight the many applications. |
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