When used together with conventional spectroscopic methods (e.g., FT-IR spectroscopy), matrix isolation constitutes a very powerful technique to investigate the photochemistry of single molecules. In matrix-isolation spectroscopy the sample to be studied is prepared by deposition under high vacuum conditions of the necessary amounts of the target substance and support gas (usually an inert gas such as argon or xenon) on a suitable optical substrate cooled at a temperature of a few degrees Kelvin. Under these conditions the spectral resolution strongly increases due to the band narrowing effects associated with both the extreme low work temperature and matrix rigidity (molecular diffusion as well as rotational and vibrational hot transitions are suppressed). Once a matrix of a given substance has been prepared, selective *in situ* irradiation can be undertaken in order to promote photochemical processes such as conformational isomerization [1,2], tautomerization [3] or fragmentation (including photo-degradation) [4].

In this communication, recent results obtained in the Laboratory for Low Temperature Molecular Spectroscopy (Department of Chemistry – University of Coimbra) using the methodology above described will be presented. These will include both ground and excited states photochemical investigations in different kinds of molecules with biological or industrial interest.

**References**


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