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**Modification of a tandem mass-spectrometer for infrared multi-photon dissociation (IRMPD) of gas-phase ions** JULIE M. GILLIS, SANDRA M. OSBURN, MICHAEL J. VAN STIPDONK, THEODORE A. CORCOVILOS, Duquesne University — Infrared multi-photon dissociation (IRMPD) is a method of fragmenting molecular ions for structural analysis of the parent molecule. The target ions absorb many photons, increasing the vibrational state of the excited bonds until the dissociation occurs. We have modified a commercial linear quadrupole trap tandem mass spectrometer (Thermo-Fisher LTQ) by installing a removable high-vacuum window in the rear accessory plate of the mass spectrometer. The window allows us to inject laser light into the ion trap. The shape of the injected laser beam is optimized to match the volume of the ion cloud within the ion trap, improving IRMPD efficiency. We present preliminary data of the IRMPD of weakly bound uranyl-acetone and uranyl-dimethyl sulfoxide clusters using a 20-W pulsed CO<sub>2</sub> laser (wavelength 10.6  $\mu m$ ), showing previously undetected fragmentation products.

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