

Group IIB-VIA Semiconductor Oxide Cluster Ions

Stoichiometric metal oxide cluster ions, $(MO)_n^\pm$: M=Zn, Cd, Hg have been generated from solid group IIB-VIA semiconductor oxide targets with a pulsed UV laser whose photon energy ($\lambda=355$ nm, $E=3.49$ eV) is greater than their respective band gap. The cluster ions formed during laser vaporization process have been identified and characterized by a home built time of flight mass spectrometer (ToFMS). Figure 1 show the excitation scheme employed and the observed mass spectra of $(ZnO)_m$, $(CdO)_m$, $(HgO)_m$ cluster ions.

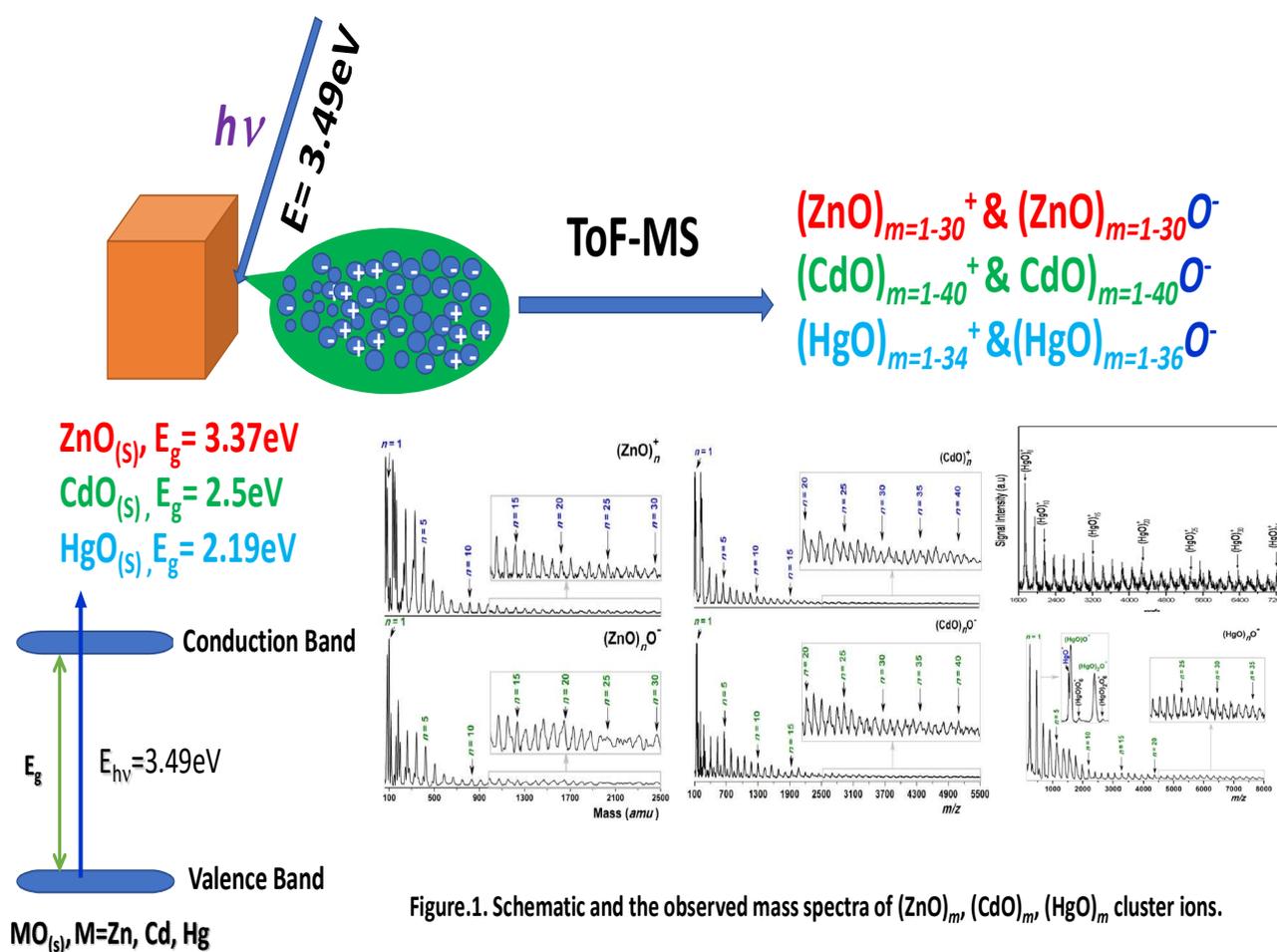


Figure.1. Schematic and the observed mass spectra of $(ZnO)_m$, $(CdO)_m$, $(HgO)_m$ cluster ions.

The observed cluster ion data may find potential application in the preparation of low dimensional quantum wire and quantum dots of these materials by pulsed laser deposition technique. Further, various novel Hg_nO_m species identified will be useful for modelling the atmospheric mercury depletion events (AMDEs) in Arctic and Antarctic regions during polar sunrise.