**1. Ph.D**

Physical chemistry (Atomic and molecular physics-Spectroscopy)

Isfahan University of Technology (IUT) in cooperation with the Abdus Salam International Center for Theoretical Physics (ICTP) and Elettra syncrotron light laboratory in Italy. 2001-2006

First rank student.

**Supervisor:** Prof. Robert Richter

Elettra Synchrotron Light Laboratory, Triste, Italy.

Prof. M. Tabrizchi

Chemistry Department, Isfahan University of Technology, Isfahan, Iran, 84156

**Advisor:**  Prof. Lorenzo avaldi

Consiglio Nazionale delle Ricerche (CNR)- Institute of inorganica methodologies and plasmas (IMIP)-Rome-Italy

**PhD Thesis:** High Resolution Inner-Shell Spectroscopic Studies of Atoms and Small Molecules with Synchrotron radiation: Metastable Molecular Oxygen and Free Cesium Atoms.

**Summary of PhD Thesis:**

* The K-shell excitation and ionization of metastable (O2 1Δg) molecules were studied using direct photoelectron spectroscopy and resonant auger spectroscopy. The K-edge photoionization spectra of metastable (O2 a1Δg) molecule were investigated at high resolution. These spectra showed a better resolution in comparison with the previously published data. The 2Δ state of the core hole ion was identified following ionization from the a1Δg state. From the analysis of the spectra the energetic and structural information of the 2Δ, 4Σ-, 2Σ- states of core hole ion was obtained and the vibrational frequency of the 2Δ state of the core hole ion was determined for the first time.
* The first resonant auger spectra of molecular oxygen following core-excitation of the metastable (O2 1Δg) molecule to the 1∏u core excited state were recorded. The high intensity of synchrotron radiation and analyzer resolution has allowed the separation of the singlet decay from the dominant triplet excitation of ground state oxygen. A fundamental interference phenomena was observed and was discussed in the framework of the “X-ray Raman Scattering Theory”. The resonant Auger spectra were used to spectroscopically characterize the core excited 1∏u state. In this study the structural information of the core excited 1∏u state was obtained for the first time.
* Direct variable photon energy X-ray photoelectron spectroscopy along with the total ion yield spectroscopy was used to measure the ionization cross-section of the 3*d* spin-orbit components of the Cs atom for the first time. The measured ionization cross-section qualitatively confirmed the theoretical calculation based on the “Spin-Orbit Activated Interchannel Coupling”.

**2. MSc.**

Physical chemistry (Statistical Thermodynamics)

Isfahan University of Technology (IUT)

1997-1999,

First rank Student.

**Supervisor:** Prof. G.A. Parsafar

Chemistry Department, Sharif university of technology, Tehran, Iran

**Advisor:** Prof. B.Najafi

Chemistry Department, Isfahan university of technology, Tehran, Iran

**MSc Thesis:** Deriving New equation of states Based on Statistical mechanics

**Summary of MSc Thesis:**

* A new equation of state was derived with two parameters for slightly dense fluids. This EOS is a modified version of van der Waals type of equation of state (NMvdW). This EOS has no temperature limitation but holds for densities lower than 1.5ρc where ρc is the critical density.
* **b.** A general new EOS based on the classical statistical mechanics was derived, which is valid for a long range of densities and temperatures for which the experimental data exists.

**3. BSc.**

Purechemistry

Isfahan University

1991-1996