

Tahereh Alavi

510 high street Apt 418
Columbia, MO 65201
☎ (+1) 573 2001950
✉ sa522@umsystem.edu

Summary

Studying the ultra-fast reaction dynamics of molecules using Coulomb explosion imaging and multi-mass coincidence detection techniques.

Education

2016–present **Ph.D. in Physical Chemistry**, *University of Missouri-Columbia, Columbia, MO.*

Research: Strong field ionization and Coulomb explosion dynamics

Advisor: Prof. Arthur G. Suits, *GPA: 3.9/4*

2011–2013 **M.Sc. in Chemical Engineering-Food Technology**, *Amirkabir University of Technology, Tehran, Iran,*

Thesis: experimental study and thermodynamic modeling of carbohydrate solubilities in water-alcohol solutions

Advisor: Prof. Gholamreza Pazuki, Prof. Ahmadareza Raesi .

2007–2011 **B.Sc. Chemical Engineering**, *Sharif University of Technology, Tehran, Iran .*

Thesis: Simulation of Acetone production by Dehydrogenation of isopropanol.

Advisor: Dr. Davood Rashtchian

Research & Academic Experience

2016–2017 **Graduate Teaching Assistant**, *physical chemistry 1 & 2.*
University of Missouri-Columbia

2017–present **Graduate Research Assistant**, *ultra-fast reaction dynamics.*
University of Missouri-Columbia

- Conducting Coulomb explosion imaging experiments coupled with covariance imaging analysis in a multi-mass coincidence detection setup: successfully resolving the fragmentation channels of thioesters
- Remote implementation and data analysis of a gas phase Ultrafast Electron Diffraction (UED) experiment at the SLAC National Accelerator Laboratory (UV dissociation of oxaly chloride)

- Conducting gas phase Time of Flight (ToF) mass spectrometry experiments and Velocity Map Ion imaging (VMI) under high vacuum conditions
- Studying state-resolved photodissociation dynamics of propargyl chloride using VMI and Resonance Enhanced Multiphoton Ionization (REMPI) techniques
- Studying the dynamics of the laser ablated actinide samples using home-built Wiley-McClaren ToF mass spectrometry setup

2013–2014 **Research Assistant Engineer**, Industrial waste-water treatment processes
National Petrochemical Research and Technology Center, Tehran, Iran.

- Advanced oxidation processes on industrial wastewater and analytical measurements to test the efficiency of the treatment

2011–2013 **Graduate Research Assistant**, *Thermodynamic Modeling*.
Amirkabir University of Technology, Tehran, Iran

- Experimental measurements of physical properties of carbohydrate-alcohol solutions
- Developing thermodynamic models to predict carbohydrate solubility in alcoholic solutions

Laboratory Skills

- Operation, maintenance, troubleshooting of ultrafast Ti:Sapphire laser system
- Experienced in single shot autocorrelator designs
- Experienced in ultrafast pulse compression through hollow core fibers
- Quantum chemical calculations using Unix based Gaussian programming
- Experienced writing technical reports and papers
- Following laboratory safety protocols and rules

Computer Skills

Programming PYTHON, MATLAB

Chemistry CHEMDRAW, SIMION (ION TRAJECTORY SIMULATIONS), GAUSSIAN (UNIX BASED OS AND GAUSSVIEW)

Drawing AUTHOCAD, 3D PRINTING

Miscellaneous MICROSOFT OFFICE, LATEX

Publications

S. T. Alavi, G. A. Cooper, A. G. Suits, "*Coulomb Explosion Dynamics of methoxycarbonyl sulfenyl chloride by 3D multimass imaging*" , J. Mol. Phys., (2021), DOI: 10.1080/00268976.2021.1988170

G. A. Cooper, S. T. Alavi, W. Li, S. K. Lee, A. G. Suits, "*Coulomb Explosion Dynamics of Chlorocarbonylsulfenyl Chloride*" , J. Phys. Chem. A., 125, (2021), DOI: 10.1021/acs.jpca.1c02332

J. O. Thompson, S. T. Alavi, J. R. Walensky, A. G. Suits, "*Time of flight mass spectrometry with direct extraction of a uranium plasma*" , Int. J. Mass Spectrom, 445, (2019), DOI: 10.1016/j.ijms.2019.116190

C. D. Foley, S. T. Alavi, B. Joalland, B. M. Broderick, N. Dias, A. G. Suits, "*Imaging the infrared multiphoton excitation and dissociation of propargyl chloride*" , Phys. Chem. Chem. Phys., 21, (2019), DOI: 10.1039/C8CP06668J

C. D. Foley, B. Joalland, S. T. Alavi, A. G. Suits, "*Mixed transitions in the UV photodissociation of propargyl chloride revealed by slice imaging and multireference ab initio calculations*" , Phys. Chem. Chem. Phys., 20, (2018), DOI: 10.1039/C8CP04596H

S. T. Alavi, G. Pazuki, A. Raeisi, "*Solubility of Fructose in Water-Ethanol and Water-Methanol Mixtures by Using H-Bonding Models*" , J. Food Sci., 79, (2014), DOI: 10.1111/1750-3841.12441

Conferences & Online Workshops

- Feb 2021 Poster Presentations: Coulomb explosion dynamics of Thioesters ; **Time-resolved imaging of photo-induced dynamics Faraday Discussion**
- June 2020 Attended the online Ultrafast X-ray Summer School 2020 and submitted a mock proposal; **the Stanford PULSE institute at SLAC**
- June 2018 Poster Presentation: Time of Flight mass spectrometry of laser-induced plasma ; **Gordon Research Conference (GRC)**, Easton, Massachusetts
- June 2017 Poster Presentation: Infrared Multiphoton Excitation and Dissociation of Propargyl Chloride: Dynamics of Cl and HCl Elimination; **Dynamics of Molecular Collisions (DMC) XXVI**, Tahoe city, California

- May 2013 Poster Presentation: Thermodynamic Modeling and Experimental Study of Solubility of Fructose in Water-Ethanol Solution; **21st National Conference of Food Science and Technology**, Shiraz, Iran
- May 2011 Poster Presentation: Analysis of Effects of Sonication and Thermosonication in Killing Bacteria; **20th National Conference of Food and Environmental Sciences**, Tehran, Iran

Certificate

- 2021 Foundations of Data Science: K-Means Clustering in Python: Coursera, Credential ID: 4DFVJBXSNKMP
- 2020 Programming for everybody (Python): Coursera, Credential ID: VAJ3KVLNXAVD

Honors and Achievements

- 2006 Winner of the regional Physics Laboratory competition, Tehran, Iran
- 2007 Ranked 490th in nationwide university entrance exam among more than 100'000 students in the field of Physics and Mathematics
- 2011 Credited to the Master program without entrance exam as a distinguished student , Tehran, Iran
- 2013 Graduated as an honor student in Master's Degree program, Tehran, Iran

References 1

- **Name:** Arthur G. Suits
- **Designation:** Curator's distinguished Professor
- **Organization:** University of Missouri-Columbia
- **Email:** suitsa@missouri.edu

References 2

- **Name:** Wen Li
- **Designation:** Assistant Professor
- **Organization:** Wayne State University
- **Email:** wli@chem.wayne.edu