

## Dr. Purav M. Badani

Designation : Assistant Professor in Chemistry  
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### Academic Record

Degree	University	Year of Passing	Class
B.Sc. (Chemistry)	University of Mumbai	2007	Distinction
M.Sc. (Physical Chemistry)	University of Mumbai	2009	Distinction <b>(University Gold Medalist)</b>
Maharashtra SET (Chemical Sciences)	-----	2011	-----
PhD (Chemistry)	B.A.R.C., University Of Mumbai	Thesis submitted (March-2014) Viva (April-2015)	-----

### Positions held

Assistant Professor	Wilson College, Chowpatty, Mumbai: 400007	Oct, 2013 – Mar, 2014
Assistant Professor	Department of Chemistry, University of Mumbai	Mar, 2014 – till date

### Membership of professional bodies

1. Life member of Society for Materials Chemistry (LM - 314).
2. Life member of Indian Society for Mass Spectrometry (LM - 750)
3. Life member of Indian Society for Radiation and Photochemical Sciences.
4. Life member of Indian Science Congress Association

## Awards and Honors

2009	Prof. A. N. Kothare Gold Medal, University of Mumbai
2009	Dr. B. N. Desai Gold Medal, University of Mumbai
2009	Dr. K. A. Hamied's Chemistry Prize, University of Mumbai
2009 - 2011	Junior Research Fellowship, Department of Atomic Energy, Government of India
2011 - 2013	Senior Research Fellowship, Department of Atomic Energy, Government of India

## Research Interest

- *Computational Chemistry*: Molecular Modeling and reaction dynamics
- *Experimental Chemistry*: Synthesis of nanoparticles and its application in degradation of dyes

## Research Project

Sr. No	Title	Funding agency	Amount	Status
1	Exploring the dissociation/ionization dynamics of molecules through electronic structure calculations (YSS/2015/001106)	DST-SERB	32.00 lakhs	Approved

## Journal Publications

1. "Interaction of nanosecond laser pulse with tetramethyl silane ( $\text{Si}(\text{CH}_3)_4$ ) clusters: Generation of multiply charged silicon and carbon ions.", **P. M. Badani**, S. Das, M. V. Rao, P. Sharma and R. K. Vatsa, *AIP Advances* 1 (2011) 042164.
2. "Multiphoton ionization and Coulomb explosion of  $\text{C}_2\text{H}_5\text{Br}$  clusters: a mass spectrometric and charge density study.", S. Das, **P. M. Badani**, P. Sharma, R. K. Vatsa, D. Das, A. Majumder and A. K. Das, *Rapid Communication in Mass Spectrometry* 25 (2011) 1028.
3. "Coulomb explosion phenomenon using gigawatt intensity laser fields: an exotic realm of laser-cluster interaction.", S. Das, **P. M. Badani**, P. Sharma and R. K. Vatsa, *Current Science* 100 (2011) 1008.
4. "Photochemistry of  $(\text{CH}_3\text{SCH}_3)_n$  and  $(\text{CH}_3\text{SSCH}_3)_n$  clusters at 355 and 532 nm using time-of-flight mass spectrometer.", P. Sharma, S. Das, **P. M. Badani** and R. K. Vatsa., *Indian Journal of Physics* 86 (2012) 195.

5. "Effect of cluster expansion on photo-ionization behavior of iron pentacarbonyl doped inert gas cluster.", **P. M. Badani**, S. Das, P. Sharma and R. K. Vatsa., *Rapid Communication in Mass Spectrometry* 26 (2012) 2204.
6. "Interaction of xenon clusters with nanosecond laser pulses: A size-dependent study.", S. Das, **P. M. Badani**, P. Sharma and R. K. Vatsa., *Chemical Physics Letters* 552 (2012) 13.
7. "Application of topology in calculation of Bond Order.", A. Y. Desai, **P. M. Badani**, S. Roy, A. D. Sawant., *International Journal of Chemistry* 1 (2012) 38.
8. "Photoionization of atomic and molecular clusters doped with low ionization energy molecules: Effect of laser wavelength, intensity and cluster composition.", **P. M. Badani**, S. Das, P. Sharma & R. K. Vatsa., *International Journal of Mass Spectrometry* 348 (2013) 53.
9. "Diverse photochemical behavior of dibromodifluoromethane (CF<sub>2</sub>Br<sub>2</sub>) monomer and cluster under gigawatt intensity laser fields.", S. Das, **P. M. Badani**, P. Sharma and R. K. Vatsa., *RSC Advances* 3 (2013) 12867.
10. "Evidence for charge-induced dipole reaction in laser ionized van der Waals clusters: A case of Fe<sup>2+</sup> reacting with argon atoms inside a cluster.", **P. M. Badani**, S. Das, P. Sharma, KRS Chandrakumar and R. K. Vatsa., *RSC Advances* 4 (2014) 2339.
11. "Generation of multiply charged tin and carbon ions in low intensity Coulomb explosion of tetramethyl tin clusters: Role of screening effects", **P. M. Badani**, S. Das, P. Sharma and R. K. Vatsa., *International Journal of Mass Spectrometry* 358 (2014) 36.
12. "Ionization of methyl iodide clusters using nanosecond laser pulses: Detection of multiply charged positive, negative and energetic electrons", S. Das, P. Sharma, **P. M. Badani** and R. K. Vatsa., *RSC Advances* 5 (2015) 8887.
13. "Mass spectrometric and charge density studies of organometallic clusters photoionized by gigawatt intensity laser pulses", **P. M. Badani**, S. Das, P. Sharma and R. K. Vatsa., *Mass Spectrometry Reviews* doi: 10.1002/mas.21469

#### Poster presentations at various symposia/conferences

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| 1. "Photochemistry of tetramethyl silane clusters.", <b>P. M. Badani</b> , S. Das, P. Sharma and R. K. Vatsa. Presented at Trombay Symposium in Radiation and Photochemistry, 2010.                                       |
| 2. "Clusters as Versatile Source for Generation of Multiply Charged Ions.", <b>P. M. Badani</b> , Venkateswara Rao, S. Das, P. Sharma and R. K. Vatsa. Presented at International Symposium in Materials Chemistry, 2010. |
| 3. "Photo-ionization behavior of Tetramethyl silane doped inert-gas clusters.", <b>P. M. Badani</b> , S. Das, M. V. Rao, P. Sharma and R. K. Vatsa. Presented at Trombay Symposium of Radiation & Photochemistry, 2012.   |

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| 4. "Photo-ionization of Pure and Doped inert gas clusters", <b>P. M. Badani</b> , S. Das, P. Sharma and R.K. Vatsa. Presented at Interdisciplinary Symposium in Materials Chemistry, 2012.   |
| 5. "Interaction of Fe(CO) <sub>5</sub> doped inert gas clusters with gigawatt intensity laser pulses." <b>P. M. Badani</b> , S. Das, P. Sharma and R.K. Vatsa. Presented at Meeting on Spectroscopy and Dynamics of Molecules and Clusters, 2013.                              |
| 6. "Photoionization of Fe(CO) <sub>5</sub> doped Xenon/SF <sub>6</sub> clusters using gigawatt intensity laser pulses.", <b>P. M. Badani</b> , S. Das, P. Sharma and R.K. Vatsa. Presented at 12 <sup>th</sup> ISMAS-TRICON, 2013.   |
| 7. "Study of ionization processes in molecular clusters using mass spectrometry." <b>P. M. Badani</b> and R. K. Vatsa. Oral Presentation at 25 <sup>th</sup> Research Scholars' Meet, 2013.  |
| 8. "Evidence of charge-induced dipole reaction in laser ionized van der Waals clusters: An experimental and theoretical investigation.", <b>P. M. Badani</b> , S. Das, KRS Chandrakumar, P. Sharma and R.K. Vatsa. Presented at Current Trends in Theoretical Chemistry, 2013. |
| 9. "Catalytic degradation of methylene blue dye using silver nanoparticles." C. Pal and <b>P. M. Badani</b> . Presented at Advances and Innovations in Chemical Sciences, 2015.  |

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