HEMAKESH MOHAPATRA

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EDUCATION

The Pennsylvania State University, USA
2008 – 2014
Ph. D. in Chemistry, Advisor: Prof. Scott T. Phillips
Thesis: Design of reagents for trace-level chemical detection and signal amplification

Indian Institute of Technology (IIT), Kharagpur, India
2007 – 2008
M. Sc. in Industrial Chemistry, Advisor: Prof. J. K. Ray
Dissertation: Synthetic studies towards oxygen containing heterocyclic compounds by an intramolecular Heck reaction

Indian Institute of Technology (IIT), Kharagpur, India
2003 – 2007
B. Sc. (Honours) in Industrial Chemistry, Advisor: Prof. J. K. Ray
Research: Synthesis of fused pyran rings by an intramolecular radical cyclization

PREVIOUS EXPERIENCE

University of Chicago, USA, *Postdoctoral researcher*
Sep 2017 – present

- Research towards developing self-strengthening polymeric gels and solids using mechanical activation of piezoelectric nanoparticles

University of California, Irvine, USA, *Postdoctoral researcher*
Dec 2014 – Aug 2017

- Developed the first example of mechanical force mediated polymerization controlled using piezoelectric effect.
- Developed a new step-growth polymerization using mechanical force – used piezoelectric effect to promote a ‘click’ polymerization.

The Pennsylvania State University, USA, *Graduate research assistant*
2008 – 2014

- Developed polymers with a 'turn-on' fluorescence response in the presence of trace levels of chemicals – these polymers undergo autonomous and self-sustaining chemical reaction once they encounter a chemical signal.
- Developed a stimuli-responsive adhesive that debonds on demand – these adhesives use polymers that depolymerize when they sense an environmental chemical signal.
- Designed several classes of chemical reagents for detection of trace chemical biomarkers and for amplification of diagnostic signal useful in the context of clinical diagnostics and detection of environmental pollutants.

Indian Institute of Technology, Kharagpur, India, *M. Sc. researcher*
2007 – 2008

- Synthesized several heterocylic compounds and was a coauthor of a synthetic methodology paper based on the research work.

PUBLICATIONS

1. **Mohapatra, H.**; Ayarza, J.; Sanders, E. C.; Scheuermann, A. M.; Griffin, P. J.; Esser-Kahn, A. P. "Ultrasound Promoted Step-Growth Polymerization and Polymer Crosslinking Via Copper Catalyzed Azide–Alkyne "Click" Reaction" *Angewandte Chemie International Edition* **2018**, *57*, (35), 11208–11212 (Impact factor: 11.994, Cited by: 14)
2. Steinhardt, R.; Hiew, S.C.; **Mohapatra, H.**; Nguyen, D.; Oh, Z.; Truong, R.; Esser-Kahn, P. "Cooperative CO_2 Absorption Isotherms from a Bifunctional Guanidine and Bifunctional Alcohol" *ACS Central Science* **2017**, *3* (12), 1271–1275. (Impact factor: 7.939, Cited by: 6)
3. **Mohapatra, H.**; Kleiman, M.; Esser-Kahn, A. P. "Mechanically Controlled Radical Polymerization Initiated by Ultrasound" *Nature Chemistry* **2017**, *9* (2), 135–139. (Impact factor: 25.87, Cited by: 104)
4. **Mohapatra, H.**; Kim, H.; Phillips, S. T. "Stimuli-Responsive Polymer Film that Autonomously Translates a Molecular Detection Event into a Macroscopic Change in Its Optical Properties via a Continuous, Thiol-Mediated Self-Propagating Reaction" *Journal of the American Chemical Society* **2015**, *137* (39), 12498–12501. (Impact factor: 13.858, Cited by: 26)
5. Brooks, A.; **Mohapatra, M.**; Phillips, S. T. "Design, Synthesis, and Characterization of Small-Molecule Reagents That Cooperatively Provide Dual Readouts for Triaging and,

When Necessary, Quantifying Point-of-Need Enzyme Assays" *Journal of Organic Chemistry* **2015**, *80* (21), 10437–10445. (Impact factor: 4.849, Cited by: 8)

6. Kim, H.; **Mohapatra, H.**; Phillips, S. T. "Rapid, On - Command Debonding of Stimuli - Responsive Cross - Linked Adhesives by Continuous, Sequential Quinone Methide Elimination Reactions" *Angewandte Chemie International Edition* **2015**, *54* (44), 13063–13067. (Impact factor: 11.994, Cited by: 32)
7. Yeung, K.; Kim, H.; **Mohapatra, H.**; Phillips, S. T. "Surface-accessible detection units in self-immolative polymers enable translation of selective molecular detection events into amplified responses in macroscopic, solid-state plastics" J*ournal of the American Chemical Society* **2015**, *137* (16), 5324–5327. (Impact factor: 13.858, Cited by: 38)
8. **Mohapatra, H.**; Phillips, S. T. "Reagents and assay strategies for quantifying active enzyme analytes using a personal glucose meter" *Chemical Communications* **2013**, *49* (55), 6134–6136. (Impact factor: 6.319, Cited by: 33)
9. **Mohapatra, H.**; Phillips, S. T. "Phase switching to enable highly selective activity-based assays" *Analytical Chemistry* **2012**, *84* (21), 8927–8931. (Impact factor: 6.32, Cited by: 3)
10. **Mohapatra, H.**; Phillips, S. T. "Using smell to triage samples in point-of-care assays" *Angewandte Chemie International Edition* **2012**, *51* (44), 11145–11148. (Impact factor: 11.994, Cited by: 27)
11. **Mohapatra, H.**; Schmid, K. M.; Phillips, S. T. "Design of small molecule reagents that enable signal amplification via an autocatalytic, base-mediated cascade elimination reaction" *Chemical Communications* **2012**, *48* (24), 3018–3020. (Impact factor: 6.319, Cited by: 25)
12. Samanta, S.; **Mohapatra, H.**; Jana, R.; Ray, J. K. "Pd(0) catalyzed intramolecular Heck reaction: a versatile route for the synthesis of 2-aryl substituted 5-, 6-, and 7-membered *O*-containing heterocycles" *Tetrahedron Letters* **2008**, *49* (50), 7153–7156. (Impact factor: 2.193, Cited by: 23)

PREVIOUS TEACHING EXPERIENCE

University of California, Irvine, *Guest lecturer*
2016

- Delivered lectures (Polymer 225) on living polymerization and physical-organic chemistry of radical polymerization.

The Pennsylvania State University, USA, *Guest lecturer*
2013

- Delivered lectures (CHEM 535) on physical-organic chemistry of aromatic substitution reactions.

The Pennsylvania State University, USA, *Graduate teaching assistant*
2008 – 2010

- Conducted laboratory classes for undergraduate organic chemistry laboratory (CHEM 213) – I was the sole instructor for two classes of 22 – 26 students.
- Conducted laboratory classes for undergraduate general chemistry laboratory (CHEM 111) – I was the sole instructor for two classes of 22 – 24 students.

SELECTED AWARDS AND SCOLARSHIPS

1. Department **travel award**, Department of Chemistry, Pennsylvania State University – 2014.
2. **Braucher Award**, Department of Chemistry, Pennsylvania State University. (Awarded for excellence in research and academic achievements) – 2012.
3. **Incoming graduate student award**, Department of Chemistry, Pennsylvania State University. (Awarded for excellence in classes and teaching) – 2009.
4. J. C. Ghosh Memorial award (**Institute Silver Medal**) for highest GPA in Integrated M.Sc. (Industrial Chemistry) awarded by IIT, Kharagpur – 2008.
5. J. C. Ghosh Memorial endowment prize (Industrial Chemistry) awarded by IIT, Kharagpur – 2007.
6. Inter-hall "Chemical Innovations" (3^{rd} place prize) awarded by Technology Students' Gymkhana, IIT, Kharagpur, (**tech event**) – 2005.
7. National certificate for securing "Top 10%" score in National Standard Examination in Physics (Olympiad) awarded by Indian Association of Physics Teachers – 2003.
8. State level certificate for 9^{th} position in Regional Mathematics **Olympiad** (Orissa) awarded by Orissa Mathematical Society – 2002.
9. National certificate for securing "Top 10%" score in National Standard Examination in Physics (Olympiad) awarded by Indian Association of Physics Teachers – 2001.
10. National Talent Scholarship (**NTS**) awarded by National Council of Educational Research and Training (NCERT) – 2001.

INTERNATIONAL CONFERENCES

1. **11th International Conference on Advancements in Polymeric Materials (APM)**, CIPET, Bengaluru, February 13 – February 15, 2020 (Presentation) "Mechanochemical strengthening of polymeric materials using piezoelectric nanoparticles".
2. **International Conference on Functional Materials (ICFM - 2020)**, IIT Kharagpur, January 6 – January 8, 2020 (As organizer).
3. **Young Investigators Meeting (YIM)**, MIT, Boston, May 26 – 28, 2018 (Presentation) "Using force to heal and strengthen plastics".
4. **Gordon Research Conference** on "Multifunctional Materials and Structures", Ventura, California, Jan 31 – Feb 5, 2016 (Poster) "Mechanical stress induced polymerization for materials remodeling".
5. **247th ACS Meeting**, Dallas, March 16 – 20, 2014 (Presentation) "Design of reagents for point-of-care diagnostics".
6. **Graduate Research Symposium**, Division of Organic Chemistry, ACS, University of Colorado, Boulder, July, 2012 (Presentation) "Design and Synthesis of Reagents for Trace-Level Chemical Detection and Signal Amplification".
7. **244th ACS Meeting**, Philadelphia, August 19 – 23, 2012 (Poster) "Design of Reagents for Chemical Detection and Signal Amplification".

OTHER INFORMATION

1. Authored 12 peer-reviewed articles in international scientific journal. (author h-index: 9, total citations:166)
2. Qualified for Graduate Aptitude Test in Engineering (**GATE**) - Chemistry, India., 2008 with percentile 99.46 and all-India rank 34
3. Member of the American Chemical Society for last 9 years.