Imran A. Deen

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PROFESSIONAL SUMMARY

Detail-oriented materials engineer with 10+ years experience in research, technical writing, materials characterization, and project management. Doctoral degree in Materials Science and Engineering, with a focus on fabricating coatings with novel materials for biomedical applications. Works well in a team, including mentorship roles, but also experienced in managing a project independently. I have authored several manuscripts that having been accepted for publication by scientific journals. Previous experience in presenting findings at seminars and conferences, locally and internationally. Fluent in English and French.

EDUCATION

Ph.D. in Materials Engineering (GPA = 3.85) — Feb 2018 – Aug 2021

Institut national de la recherche scientifique, Varennes, QC

Thesis: Additive-enhanced Biopolymer Scaffolds for Bone Repair

M.A.Sc in Materials Science & Engineering (GPA = 3.6) — Sept 2010 – Aug 2012

McMaster University, Hamilton, ON

Thesis: Electrodeposition of Organic-Inorganic Films for Biomedical Applications

B.Eng. in Materials Science & Engineering and Society (GPA = 3) — Sept 2005 – Apr 2010

McMaster University, Hamilton, ON

Area of Concentration: general/nanomaterials stream

Capstone project: The quantification of impurities present in polycrystalline silicon

Minor: French

EXPERIENCE

Research Associate — Sept 2022 – Present

Concordia University, Montreal, QC

Developed polymer nanocomposite for Electromagnetic interference (EMI) shielding and electrical routing. Fabricated polydimethylsiloxane (PDMS) devices, simulating EMI shielding for devices, and investigated novel patterns to improve shielding. Tested electrical properties of conductive PDMS devices for use as routing in energy harvesters. Built and tested experimental set-ups, presented results at group meetings. Supervised the fabrication of 3D printed biopolymer scaffolds using direct sound printing.

Supervised graduate students in conducting experiments and presenting results for their defense, and prepared manuscripts for academic publications.

Research Assistant — Feb 2018 – Dec 2021

Institut national de la recherche scientifique, Varennes, QC

Administered project involving the fabrication of polymer/glass coatings onto stainless steel substrates for orthopaedic implants. Responsible for project timeline and deliverables, procurement of equipment and materials, updating safety protocols, liaising with external laboratories and presenting findings in group meetings, pre-doctoral exam, thesis defense, conferences.

Researched and designed protocols to fabricate coatings for experiments, and characterized materials composition and properties via different techniques (SEM, XRD, QCM, ASTM tests, ATR-FTIR, TGA). Presented research as a talk at the TMS 2019 Annual Meeting & Exhibition (TMS2019) and the 11th International Conference on High-Performance Ceramics (CICC-11).

Mentored younger students and fellow labmates, helping with characterization, technical instruction of instruments, and creating presentations and posters to present their research.

Research Assistant Jan 2013 – Feb 2018

McGill University, Montreal, QC

Managed projects involving the creation of hydrogels incorporating additives to increase the formation of hydroxyapatite (a component of bone), as well the incorporation of glass phosphate particles in chitosan hydrogels to improve crosslinking between chains, nucleation of hydroxyapatite in gel.

Characterized the structure and properties of the hydrogels via several experimental techniques (ATR-FTIR, DTA, SEM, mass analysis, XRD, PSA, BET and fluorescence intensity plate reader).

Teaching Assistant Sept – Dec 2010/2011

McMaster University, Hamilton, ON

Created lesson plan for the Materials 2X03: Structure of Materials. Revised and updated course material, held weekly tutorial sessions for a class of 60 students. Created problems for tests and marked them in a timely manner. Held office hours/tutorials to help students with any problems they encountered.

M.A.Sc Student Sept 2010 – Aug 2012

McMaster University, Hamilton, ON

Managed a project entailing the electrophoretic deposition (EPD) of composite polymer ceramic films for biomedical applications. Developed protocols to deposit films and analyse their characteristics and properties (morphology, structure, composition, deposition kinetics) using multiple techniques (SEM, TEM, DTA/TGA, XRD, QCM, Linear Polarization). Presented research at the 2011 ECS Annual General Meeting ("Electrodeposition of Organic-Inorganic Films for Biomedical Applications") poster session.

Assembled a database of laboratory chemicals to aid in maintaining a stock as well as create record of chemicals present for laboratory safety.

AWARDS & SCHOLARSHIP

- INRS scholarship 2018
- Graduate Excellence Fellowships (GEF) 2013
- McGill Engineering Doctoral Award (MEDA) 2013
- ASM Research Poster Presentation (2nd place) 2008
- McMaster Honour Award (lvl. 3) 2005
- ACCPI scholarship (for academic achievement, extracurriculars, community service) 2005

PUBLICATIONS

- M. Taheri, I. Deen, M. Packirisamy, M.J. Deen, "*Metal oxide-based electrical/electrochemical sensors for health monitoring systems,"* Trends in Analytical Chemistry, Decembre 2023
- I. Deen, G.S. Selopal, Z.M. Wang and F. Rosei, "*In vitro Characterization of Copper-doped Phosphate Glasses for Bone Tissue Engineering*," Journal of Materials Chemistry B, submitted November 2023 (In peer review)
- J. Siddiqui, M.Taheri, M. Nami, I. Deen, M. Packirisamy, "*Carbon-Based Electrochemical Free Chlorine Sensors*," Advanced Materials Technologies, July 2023, doi: https://doi.org/10.1002/admt.202300717
- I. Deen, G.S. Selopal, Z.M. Wang and F. Rosei, "*Electrophoretic deposition of collagen/chitosan films with CuO-doped phosphate glasses for orthopaedic implant*s," Journal of Colloid and Interface Science, vol. 607(Part 1), 869-880, February 2022, doi: 10.1016/j.jcis.2021.08.199

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- I. Deen and F. Rosei, "*Silk fibroin-derived polypeptides additives to promote hydroxyapatite nucleation in dense collagen hydrogels*," PLoS ONE, vol. 14(7), e0219429, July 2019, doi: 10.1371/journal.pone.0219429.
- I. Deen and I. Zhitomirsky, "*Electrophoretic deposition of composite halloysite nanotube–hydroxyapatite–hyaluronic acid films*," Journal of Alloys and Compounds, vol. 586, pp. S531–S534, Feb. 2014, doi: 10.1016/j.jallcom.2013.01.088.
- I. Deen, X. Pang, and I. Zhitomirsky, "*Electrophoretic deposition of composite chitosan–halloysite nanotube–hydroxyapatite films,*" Colloids and Surfaces A, vol. 410, pp. 38–44, June 2012, doi: 10.1016/j.colsurfa.2012.06.011.
- Y. Wang, I. Deen, and I. Zhitomirsky, "*Electrophoretic deposition of polyacrylic acid and composite films containing nanotubes and oxide particles,"* Journal of Colloid and Interface Science, vol. 362(2), pp. 367–374, Oct. 2011, doi: 10.1016/j.jcis.2011.07.007.
- M. W. Shinwari, D. Zhitomirsky, I. A. Deen, P. R. Selvaganapathy, M. J. Deen, and D. Landheer, "*Microfabricated Reference Electrodes and their Biosensing Applications*," Sensors, vol. 10(3), pp. 1679–1715, Mar. 2010, doi: 10.3390/s100301679.

LANGUAGES

- English – native language
- French – speaks/reads/writes fluently (DELF B2)

VOLUNTEER EXPERIENCE

Materials Science and Engineering Student Club President, McMaster Engineering Society Representative (Engineering & Society, Materials Science and Engineering), McMaster Shaolin Kung Fu Club vice-president. Volunteer at May@Mac, Halton Engineering Challenge, McMaster Engineering Olympics, First Year Information Session, Ontario Engineering Challenge. Student mentor at Dundas public library summer reading program and after-school homework club

ACTIVITIES AND INTERESTS

Running (half-marathon), Kung Fu (1st degree black belt), reading (52-week challenge), biking, orienteering, programming (python, beginner level)