**Abdelrahman Hamdan**

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[ResearchGate](https://ur1.app/Ff5zS), [GoogleScholar](https://scholar.google.com/citations?user=NVfRf-sAAAAJ&hl=en)

**EDUCATION**

* *UNSW, Sydney, School of Civil and Environmental Engineering, PhD in Civil Engineering* (*2019-2023).*

**Thesis Topic:** “The role of chemical composition and structure of calcium magnesium aluminosilicate glassy phase on the reaction kinetics and microstructure development of alkali-activated materials.”.

**Courses Completed**: CVEN9824 Advanced Materials Technologies – MATS6112 Characterisation of Materials – MATS6101 Phase equilibria.

* *The University of Manchester, UK. (2014-2015) MSc. Structural Engineering*.

**Dissertation Topic**: “Numerical investigation of stress concentration factors (SCFs) in small I-beam welded to a large circular hollow section (CHS) column”.

**GPA in the Taught Part**: **79.3**, **GPA in the dissertation**: **79**, **Overall: 79.2 (distinction and topper in the Structural Engineering section)**

**Courses Taken**: Advanced Structural Analysis – Steel and Concrete Structures 1 – Research Methods – Foundations for Engineers – Steel and Concrete Structures 2 –Earthquake Engineering – Fire Engineering – Finite Elements.

* *An-Najah National University, West Bank, Palestine. BSc. Civil Engineering (GPA 3.35) 2008-2012.*

A wide range of topics had been considered e.g., Structural Engineering, Transportation Engineering, and Project Management.

**WORK EXPERIENCE**

* ***PhD researcher in Cement and Concrete:*** *School of Civil and Environmental Engineering, UNSW, Sydney.*

This includes the synthesis of highly pure cementitious materials (such as C3S, Ye’elimite and CaO-MgO-Al2O3-SiO2glasses) using chemical routes, characterisation of cementitious materials, studying the reaction kinetics of hydrated cement, alkali-activated materials, and waste valorization into useful construction materials.

*For this purpose, I used* *X-ray diffraction (XRD) coupled with Rietveld analysis, thermogravimetric (TG) analysis, Fourier transformation infrared (FTIR) spectroscopy, solution and solid-state nuclear magnetic resonance (NMR) spectroscopy, nitrogen gas adsorption (NGA) technique, laser diffraction method for particle size distribution (PSD) characterisation, calorimetry measurements, ultrasonic pulse velocity (UPV) technique, dissolution measurement, inductively coupled plasma-optical emission spectroscopy (ICP-OES), scanning electron microscopy coupled with Dispersive X-Ray Analysis (SEM-EDX) and thermodynamic modelling.*

09/2019 – present.

* ***Instructor:*** *Department of Civil and Environmental Engineering, Birzeit University.* Teaching:

Statics, Mechanics of Materials, Structural Analysis 1, and Construction Materials Lab. 02/2016 – 09/2019.

**LANGUAGES**

* **Arabic**: Mother Language.
* **English**: Excellent.

**JOURNAL PUBLICATIONS**

[1] **A. Hamdan**, A. Hajimohammadi, B. Njegic, T. Kim, *The changes in the reaction kinetics and phase assemblage of sodium silicate-activated CaO-MgO-Al2O3-SiO2 glasses induced by the Al replacement by Mg*, *Cement and Concrete Research.* 166 (2023): 107103, <https://doi.org/10.1016/j.cemconres.2023.107103>

[2] **A. Hamdan**, A. Hajimohammadi, A. Rawal, T. Kim, *The intrinsic role of network modifiers (Ca versus Mg) in the reaction kinetics and microstructure of sodium silicate-activated CaO-MgO-Al2O3-SiO2 glasses*, *Cement and Concrete Research*. 164 (2023) 107058. <https://doi.org/10.1016/j.cemconres.2022.107058>.

[3] **A. Hamdan**, T. Kim, A. Hajimohammadi, *Quantitative description of the effect of slag surface area on its reaction kinetics in sodium silicate-activated materials*, RILEM Technical Letters. 7 (2022) 150–158. <https://doi.org/10.21809/rilemtechlett.2022.167>.

[4] **A. Hamdan**, T. Kim, A. Hajimohammadi, F.M. Alnahhal, A. Rawal, *Synthesis of chemically controlled cementitious materials using organic steric entrapment (OSE) method: Process, advantages, and characterisation*, *Cement and Concrete Research*. 153 (2022). <https://doi.org/10.1016/j.cemconres.2021.106698>.

[5] M.F. Alnahhal, **A. Hamdan**, A. Hajimohammadi, T. Kim, *Effect of rice husk ash-derived activator on the structural build-up of alkali activated materials*, *Cement and Concrete Research*. 150 (2021) 106590. <https://doi.org/10.1016/j.cemconres.2021.106590>.

**IN PROGRESS**

[6] **A. Hamdan**, I. Al-damad, A. Hajimohammadi, B. Njegic, K. Gong, T. Kim, *Physical and chemical exploration to study the fundamental reasons for different reactivity observed from two slags produced at the same plant.* In progress.

[7] **A. Hamdan**, H. Song, Z. Yao, M.F. Alnahhal, A. Hajimohammadi, T. Kim, *Modifications to reactions mechanisms, phase assemblages and mechanical properties of alkali-activated slags induced by gypsum addition*. In progress.

[8] **A. Hamdan**, A. Hajimohammadi, T. Kim, *The role of Na2O, Fe2O3 and TiO2 on reactivity and phase assemblage of alkali-activated materials*. In progress.

[9] M.F. Alnahhal, **A. Hamdan**, A. Hajimohammadi, T. Kim, *Hydrothermal synthesis of sodium silicate from rice husk ash: Effect of process on availability and structure of silicate.* In progress.

**AWARDS**

* *University International Postgraduate Award (UIPA), Sydney, Australia. Full scholarship at the University of New South Wales (UNSW), 2019-2023.*
* *Best performance student in Structural Engineering for the 2014/2015 academic year. The University of Manchester, UK, 2015.*
* *Hani Qaddumi Scholarship Foundation Award. Amman, Jordan. Full grant for MSc Study at The University of Manchester, UK, 2014-2015.*

**REFERENCES**

* Taehwan Kim, Senior Lecturer, School of Civil and Environmental Engineering, UNSW, Sydney. taehwan.kim@unsw.edu.au.
* Ailar Hajimohammadi, Associate Professor, School of Civil and Environmental Engineering, UNSW, Sydney. ailar.hm@unsw.edu.au.
* Aditya Rawal, Senior Lecturer, Nuclear Magnetic Resonance Facility, UNSW, Sydney. a.rawal@unsw.edu.au.