

Sesión plenaria (Miércoles 9 de octubre del 2019, 16:00 h)

Conferencia temática especializada

Interlinking microstructure with chloride resistance of alkali-activated materials

La **Dra. Susan A. Bernal**, Profesora e investigadora en la University of Leeds, United Kingdom, vendrá a Chiapas para participar en la sesión plenaria del miércoles 09 de octubre del 2019 a las 11:30 am en el Centro de Convenciones "Dr. Manuel Velásco Suárez" de la Universidad Autónoma de Chiapas.

Resumen

Worldwide over 10 billion tons of concrete are produced annually, making this the largest volume manufactured product other than potable water. Concrete infrastructure is usually designed with a service life of at least 50 years, and much longer than this for some safety-critical or high-prestige constructions, so it is essential to demonstrate that the materials used in construction will be able to fulfill their design requirements for at least this period of time.

However, it is rarely, if ever, possible to conduct a 50-year testing campaign during the process of material selection and specification. This means that a detailed fundamental understanding of material characteristics and associated degradation mechanisms must be generated in an accelerated timeframe to underpin the innovation in formulation and use of cementitious materials as the "glue" that binds together our concrete infrastructure.

In this talk new understanding of the chemical interactions between chlorides and cementitious materials will be presented, highlighting the role of chemical binding of chlorides in enhancing the resilience of modern and future concretes. This new insight was then combined with phase assemblage predicted via thermodynamic modelling, to develop a new predictive framework of chloride permeability, as a function of binder mix design, and thickness of the concrete cover.

Dra. Susan A. Bernal

Dr Susan A. Bernal holds BEng and DEng in Materials Engineering from Universidad del Valle, Colombia. She joined the School of Civil Engineering at University of Leeds in the United Kingdom, as University Academic Fellow in Cementitious Materials, and holds a prestigious EPSRC Early Career Fellowship in Multi-scale Engineering of Sustainable Concretes.



Previously she was Research Fellow in Cements in the world leading NucleUS Immobilisation Science Laboratory in Department of Materials Science and Engineering at The University of Sheffield, United Kingdom (2012-2018). During that period, she also held a one year appointment (2015-2016) as Lecturer in Concrete Technology in the Civil and Structural Engineering Department of this University. Prior to this, she was a Postdoctoral fellow (2009-2010) with Professor Jørgen Skibsted in the iNANO Instrument Center for Solid-State NMR Spectroscopy, Chemistry Department at Aarhus University, Denmark, and she then undertook a Research Fellow position (2010-2012) focusing on durability assessment of alkali-activated concretes, with Professor Jannie van Deventer and Professor John Provis in the Chemical and Biomolecular Engineering Department at the University of Melbourne, Australia. Dr Bernal was recipient of the 2016 RILEM Gustavo Colonnetti medal, awarded to researchers of less than 35 years, for her outstanding scientific contributions to the field of materials and structure. She is the only Latin-American women ever awarded a medal by the RILEM organisation, and she actively participate in six of its technical committees. Dr Bernal leads international efforts in understanding durability of concretes with supplementary cementitious materials (SCMs), as Deputy-Chair of the RILEM Technical Committee (TC 281-CCC) on carbonation of concretes with SCMs with >86 members across 20 countries. She is also part of the UKCRIC National Centre for Infrastructure Materials at University of Leeds, a £14M world-leading facility specialising in aging of infrastructure materials, structures monitoring and robotics for infrastructure applications. Dr. Bernal currently leads a team of 7 members working on development of new cement technologies, durability of cement and concrete, and development of sensors for monitoring of structures. She has published more than 300 journal and conference articles in different areas of alternative cements chemistry, durability of cement and concretes and encapsulation/ immobilisation of radioactive nuclear wastes via cementation.

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