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November 03, 2014, Pages 1-830

Handbook of Alkali-Activated Cements, Mortars and Concretes (B) Book)[Pacheco-Torgal, F.^a](#), [Labrincha, J.A.^e](#), [Leonelli, C.^b](#), [Palomo, A.^c](#), [Chindaprasirt, P.^d](#)^a University of Minho, Guimarães, Portugal^b Università degli Studi di Modena e Reggio Emilia, Modena, Italy^c Instituto Eduardo Torroja (IETcc-CSIC), Madrid, Spain[View additional affiliations](#)

Abstract

This book provides an updated state-of-the-art review on new developments in alkali-activation. The main binder of concrete, Portland cement, represents almost 80% of the total CO₂ emissions of concrete which are about 6 to 7% of the Planet's total CO₂ emissions. This is particularly serious in the current context of climate change and it could get even worse because the demand for Portland cement is expected to increase by almost 200% by 2050 from 2010 levels, reaching 6000 million tons/year. Alkali-activated binders represent an alternative to Portland cement having higher durability and a lower CO₂ footprint. Reviews the chemistry, mix design, manufacture and properties of alkali-activated cement-based concrete binders. Considers performance in adverse environmental conditions. Offers equal emphasis on the science behind the technology and its use in civil engineering. © 2015 Elsevier Ltd. All rights reserved.

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Chapters in this Book

29 Chapters found in Scopus

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Cited by 3 documents

[Alkali-activated cements and mortars based on blast furnace slag and red clay brick waste](#)Rakhimova, N.R. , Rakhimov, R.Z.
(2015) Materials and Design[High calcium fly ash geopolymer mortar containing Portland cement for use as repair material](#)Phoo-Ngernkham, T. , Sata, V. , Hanjitsuwan, S.
(2015) Construction and Building Materials[Mix design, properties and cost analysis of fly ash-based geopolymer foam](#)Abdollahnejad, Z. , Pacheco-Torgal, F. , Félix, T.
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