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November 03, 2014, Pages 1-830

**Handbook of Alkali-Activated Cements, Mortars and Concretes** (B) Book)[Pacheco-Torgal, F.<sup>a</sup>](#), [Labrincha, J.A.<sup>e</sup>](#), [Leonelli, C.<sup>b</sup>](#), [Palomo, A.<sup>c</sup>](#), [Chindaprasirt, P.<sup>d</sup>](#)<sup>a</sup> University of Minho, Guimarães, Portugal<sup>b</sup> Università degli Studi di Modena e Reggio Emilia, Modena, Italy<sup>c</sup> 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 CO<sub>2</sub> emissions of concrete which are about 6 to 7% of the Planet's total CO<sub>2</sub> 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 CO<sub>2</sub> 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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[Pacheco-Torgal, F.](#); University of Minho, Portugal

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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 geopolymers 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 geopolymers foam](#)Abdollahnejad, Z. , Pacheco-Torgal, F. , Félix, T.  
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