

Table of Contents

Preface

Committees

Keynote Lecture

Status and Prospects of Research and Application of Alkali-Activated Materials

P.V. Krivenko

1

SECTION I – PREPARATION

Preparation and Stability of Alkali Activated Materials from Slag and Fly Ashes

V. Bílek

11

Recent Development of Magnesium-Based Cements - Magnesium Phosphate Cement and Magnesium Oxychloride Cement

Z. Li, F. Qiao and C.K. Chau

21

Geopolymer Binders in Composite Cements and Ceramic-Like Materials

C. Kaps and M. Hohmann

31

Dissolution-Reorientation-Polycondensation Process of Metakaolin in Alkaline Solutions Related to Geopolymerization

Y.S. Zhang, W. Sun and Z. Li

41

Understanding Study of Silicate Based Gel Formed during the Setting Ceramic Materials

M.T. Tognonvi, S. Rossignol and J.P. Bonnet

51

Use of Sodium Silicate Gel as Precursor of Binder for Cold Consolidated Materials

M.T. Tognonvi, S.S. Kouassi, T. Maeda, J. Soro, S. Rossignol and J.P. Bonnet

57

Geopolymer Development by Powders of Metakaolin and Wastes in Thailand

C. Tippayasam, S. Boonsalee, S. Sajjavanich, C. Ponzoni, E. Kamseu and D. Chaysuwan

63

Physical, Mechanical and Micro-Structural Properties of F Type Fly-Ash Based Geopolymeric Bricks Produced by Pressure Forming Process

Ö. Ariöz, K. Kiliç, M. Tuncan, A. Tuncan and T. Kavas

69

SECTION II – CHARACTERIZATION

Application of Micromechanics on Alkali-Activated Materials

V. Šmilauer, F. Škvára, J. Němeček, L. Kopecký and P. Hlaváček

75

Evaluation of the Stability of Waste-Based Geopolymeric Artificial Aggregates for Wastewater Treatment Processes under Different Curing Conditions

I.C. Silva, J.P. Castro-Gomes and A. Albuquerque

86

Durability of Geopolymer Concretes upon Seawater Exposure

S. Astutiningsih, D.M. Nurjaya, H.W. Ashadi and N. Swastika

92

Role of Alkaline Cations on Geomaterial Foams

E. Prud'Homme, P. Michaud, E. Joussein, C. Peyratout, A. Smith and S. Rossignol

97

Comparative Study of the Consolidation Process and Properties of Clay Based Geomaterials and “Geomimetic” Lateritic Clay Based Materials

G.L. Lecomte, A. Wattiaux and G. Lecomte

107

New Geopolymers Based on Electric Arc Furnace Slag

M.C. Bignozzi, L. Barbieri and I. Lancellotti

117

Characterization of Geopolymer Materials Containing MSWI Fly Ash and Coal Fly Ash

S. Andini, R. Cioffi, F. Colangelo, C. Ferone, F. Montagnaro and L. Santoro

123

Formation of Tetra-Coordinated Aluminum in the Low Temperature Ashes

P. Straka

129

SECTION III – INDUSTRIALIZATION & APPLICATION

Medium to Long Term Engineering Properties and Performance of High-Strength Geopolymers for Structural Applications

K. Sagoe-Crentsil, T. Brown and S.Q. Yan

135

Bond Strengths of Geopolymer and Cement Concretes P. Sarker	143
Use of Local Raw Materials for Construction Purposes H. Rahier, F. Slatyi, I. Aldabsheh, M. Alshaaer, H. Khoury, M. Esaifan and J. Wastiels	152
Development of Building Materials through Alkaline Activation of Construction and Demolition Waste (CDW) - Resistance to Acid Attack J. Gonçalves Rapazote, C. Laginhas and A. Teixeira-Pinto	156
Repairing of Damaged Stone in Monuments and Stone Buildings A. Teixeira-Pinto	164
Geopolymers as Waste Encapsulation Materials: Impact of Anions on the Materials Properties F. Frizon and C. Desbats-le-Chequer	174
Recycling of Industrial Wastewater by its Immobilization in Geopolymer Cement D. Tavor, T. Meyohas, S. Ronen and A. Wolfson	180
How to Assess the Environmental Sustainability of Geopolymers? A Live Cycle Perspective M. Weil, A. Buchwald and K. Dombrowski-Daube	186
Chemical and Biological Characterization of Geopolymers for Potential Application as Hard Tissue Prostheses M. Catauro, F. Bollino, I. Lancellotti, E. Kamseu and C. Leonelli	192