

Conformability of Aggregate in Concrete and Alkali Silica Reaction Products

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2001 Fiscal Year Final Research Report Summary

Conformability of Aggregate in Concrete and Alkali Silica Reaction Products

Research Project

Project/Area Number

10650449

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

土木材料・力学一般

Research Institution

Kanazawa University

Principal Investigator

KAWAMURA Mitsunori Kanazawa University, Civil Engrg, Professor, 工学部, 教授 (20019730)

Co-Investigator(Kenkyū-buntansha)

IGARASHI Shin-ichi Kanazawa University, Civil Engrg, Assoc. Professor, 工学部, 助教授 (50168100)

TORII Kazuyuki Kanazawa University, Civil Engrg, Professor, 工学部, 教授 (50115250)

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Keywords

alkali silica reaction / fly ash / blastfurnace slag / silica fume / lithium salts / ultra-high strength concrete

Research Abstract

The achievements obtained in this study are divided into the four themes of ASR suppression mechanisms of mineral admixtures, irlples of Ca(OH)₂ in ASR gel composition, effects of lithium salts on ASR gel compositions and ASR in ultra-high strength concrete. The items revealed in each theme are summarized as follows ;

- (1) ASR gels were found to be produced even in fly ash-containing mortars showing no expansion.
- (2) Iri blastfurnaceTContaining jmprtars, reductions in/OH⁻ ion concentration are not so great, and the suppression of ASR expansion in the mortars is due to the reduction in the mobility of ions and pore solution through the cement paste phase.
- (3) In silica fume-containing mortars, the suppression of ASR expansion is, brought about by great reductions in OH⁻ ion concentration in, the pore solution.
- (4)The pore solution intruded into fissures in the cacined flint aggregate particles in mortars, and then ASR occurred along silica surfaces in the fissures.

(5) The composition of ASR gels was homogenized by the addition of lithium salts. However, the homogenization in the ASR gels may not directly be related to the suppression of ASR.

(6) In mortars with an extremely low water : cement ratio, ASR gels produced within reactive aggregate particles could not permeate into the cement paste, and were accumulated in cracks within the cement paste.

Research Products (22 results)

All Other

All Publications

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[Publications] Kawamura, M., Fuwa, H., Juni, M.: "ASR Gel Composition and Expansion in Mortars with an Extremely Low Water : Cement Ratio"Proceedings of the 8th Euroseminar on microscopy Applied to Building Materials, Athens, Greece. 159-166 (2001) ▼

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