

# ポゾランのアルカリ骨材反応による膨張防止効果とその機構に関する研究

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# 1986 Fiscal Year Final Research Report Summary

## EFFECTIVENESS OF POZZOLAN IN PREVENTING EXPANSION DUE TO ALKALI-AGGREGATE REACTION AND ITS MECHANISM

Research Project

### Project/Area Number

59460138

### Research Category

Grant-in-Aid for General Scientific Research (B)

### Allocation Type

Single-year Grants

### Research Field

コンクリート工学・土木材料・施工

### Research Institution

KANAZAWA UNIVERSITY

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### Project Period (FY)

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### Keywords

POZZOLAN / ALKALI-SILICA EXPANSION / PREVENTION / ALKALI CONCENTRATION / PORE SOLUTION / アルカリ濃度

### Research Abstract

1. THE EFFECT OF POZZOLAN ON THE PREVENTION OF ALKALI-SILICA EXPANSION IS FOUND TO LARGELY DEPEND UPON THE TYPE OF POZZOLAN AND REACTIVE AGGREGATE, ALKALI CONCENTRATION OF THE PORE SOLUTION AND CONTENT OF POZZOLAN IN MORTARS. THEREFOR, THE EFFECTS OF ALL POZZOLANS ON ALKALI-SILICA EXPANSION CAN NOT BE TOTALLY EXPLAINED BY ONE OF SOME MECHANISMS.  
2. IN THE MORTARS MADE WITH BELTANE OPAL AS A REACTIVE AGGREGATE, IF THE AMOUNT OF CEMENT REPLACED BY FLY ASHES OR BLAST FURNACE SLAGS IN JAPAN IS MORE THAN 25% OR 60% BY WEIGHT, RESPECTIVELY, ALKALI-SILICA EXPANSION CAN BE PREVENTED.  
PREVENTIVE ABILITY OF FLY ASHES OR BLAST FURNACE SLAGS IN JAPAN AGAINST THE ALKALI-SILICA EXPANSION CORRELATES WITH THE REDUCED

ALKALINITY IN PORE SOLUTION DUE TO THEIR ADDITION.

3.SOME FACTORS OTHER THAN REDUCED ALKALINITY IN PORE SOLUTION ALSO APPEAR TO BE RELATED TO THE PREVENTION OR REDUCTION OF EXPANSION DUE TO ALKALI-SILICA REACTION BY INCORPORATION OF SOME POZZOLANS.

4.ADDITION OF RELATIVELY SMALL AMOUNT OF SILICA FUME WHICH IS EXPECTED TO HAVE A POSSIBILITY OF PREVENTING ALKALI-SILICA EXPANSION FOR ITS HIGH POZZOLANIC ACTIVITY WAS FOUND TO ENHANCE EXPANSION OF MORTARS. THIS ENHANCEMENT OF EXPANSION IS ATTRIBUTABLE TO THE DELAY IN SOFTENING OF THE GELS FORMED IN THE SILICA FUME-BEARING MORTARS.

## Research Products (15 results)

All Other

All Publications (15 results)

[Publications] 川村満紀: セメント技術年報. 38. 98-101 (1984) ▼

[Publications] 川村満紀: セメント技術年報. 39. 340-343 (1985) ▼

[Publications] 川村満紀: セメント・コンクリート. 29-35 (1986) ▼

[Publications] M.Kawamura: Proc.of the Second Internatinal Conference on the Use of FlyAsh Silica Fume,Slag & Natural Pozzolans in Concrete(Madrid). 2. 999-1012 (1986) ▼

[Publications] 川村満紀: セメント技術年報. 40. 328-331 (1986) ▼

[Publications] 川村満紀: セメント技術年報. 40. 344-347 (1986) ▼

[Publications] 川村満紀: セメント技術年報. ▼

[Publications] M.Kawamura: Proc.of the 7th International Conference on Alkali-Aggregate Reaction. ▼

[Publications] M.Kawamura: Proc.of Katharine and Bryant Mather International Conference on Concrete Dunability. ▼

[Publications] MITSUNORI KAWAMURA: "EFFECT OF VARIOUS POZZOLANIC ADDITIVES ON ALKALI-SILICA EXPANSION IN MORTARS MADE WITH TYPES OPALINE REACTIVE AGGREGATES" CAJ REVIEW. 38. 92-95 (1984) ▼

[Publications] MITSUNORI KAWAMURA: "EFFECTS OF VARIOUS SILICA FUMES IN PREVENTING ALKALI-SILICA EXPANSION" PROC. OF KATHARINE AND BRYANT MATHER INTERNATIONAL CONFERENCE ON CONCRETE DURABILITY. ▼

[Publications] MITSUNORI KAWAMURA: "EFFECT OF SILICA FUME ON ALKALI-SILICA EXPANSION AND ITS MECHANISM" CAJ REVIEW. 39. 258-261 (1985) ▼

[Publications] MITSUNORI KAWAMURA: "EFFECT OF SILICA FUME ON ALKALI-SILICA EXPANSION IN MORTARS" PROC. OF THE SECOND INTERNATIONAL CONFERENCE ON THE USE OF FLY ASH, SILICA FUME, SLAG & NATURAL POZZOLANS IN CONCRETE. 2. 999-1012 (1986) ▼

[Publications] MITSUNORI KAWAMURA: "EFFECTS OF POZZOLANS AND A BLAST FURNACE SLAG ON ALKALI HYDROXIDE CONCENTRATIONS IN POR SOLUTIONS AND ALKALI-SILICA EXPANSION" CAJ REVIEW. 40. 262-265 (1986) ▼

[Publications] MITSUNORI KAWAMURA: "EFFECTS OF VARIOUS FLY ASHES AND BLAST FURNACE SLAGS IN PREVENTING ALKALI-SILICA EXPANSION" CAJ REVIEW. 40. 276-279 (1986) ▼

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