

Chanakorn Wongtanarasarin 2015: Efficiency of Synthetic Zeolite (Zeolite A) on Damage Control of ASR. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Suvimol Sujjavanich, Ph.D. 129 pages.

This thesis investigated the feasibility of using synthetic zeolite to control ASR damage. The study was divided into 3 parts: 1. Investigation of material and zeolite activation. 2. Expansion test of mortars with and without synthetic and modified synthetic zeolite. 3. Expansion and mechanical tests of concrete. Other activation methods were also included in this study for comparison and recommendation.

The results show that the use of small amount of synthetic zeolite (<5%) resulted in the decrease of ASR expansion. The high sodium ion content of the studied synthetic zeolite, resulted in the leaching of sodium and the consequently the increase of the expansion if large amount was used. The mixture with 2.5% modified synthetic zeolite was found to be most effective in reducing the expansion, while improving the mechanical properties of the concrete.

The use of 10 to 20 percent cement replacement by natural zeolite yielded the better expansion reduction compared to those of synthetic zeolite.

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Thesis Advisor's signature

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