

Watcharagon Wongkamjan 2014: Influence of Fault Zone Aggregates and Chloride on Alkali Silica Reaction. Doctor of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Suvimol Sujjavanich, Ph.D. 177 pages.

This study aimed to investigate the influence of fault zone aggregates on alkali silica reaction (ASR) using aggregates from the same source but from different areas. In east of Thailand; fault zone aggregates (FZ), moderate quartz zone of greywacke aggregates (MZ) and large zone of greywacke aggregates (LZ). Moreover pessimum effect and effects of chloride diffusion on ASR were also studied.

The results indicated that all studied aggregates were quite similar in oxide compositions while FZ was different in mineral compositions and physical characteristics. Thin-section analysis indicated that FZ was classified of Class III “very likely to be alkali-reactive”. The findings indicated that the fault zone aggregates increased the ASR risk and may be considered as more deleterious than those of the other aggregates. The largest expansion of FZ was observed from accelerated methods of mortar-bar, concrete microbar and concrete prism. The results of thin-section, Opto-digital microscopy and SEM also confirmed this finding. However evidence of pessimum effect of FZ was not observed.

Study on the effects of sodium chloride by accelerated expansion of concrete prisms, showed that chloride ions reduced ASR reactivity. The analysis of ASR products using ion-selective electrodes technique showed that the higher of chloride concentration decreased expansion and inductive coupled plasma analysis also shown that the higher chloride concentration increased sodium and the decreased of potassium ions concentration. The crystallinity index of aggregates tended to increase as the chloride concentration increased.

---

Student's signature

---

Thesis Advisor's signature