

# **Pozzolanic reaction between natural/artificial coarse aggregate and concrete matrix**

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**KEYWORDS:** concrete, aggregate, glass, pozzolanic, portlandite

## **ABSTRACT**

Sandstone aggregate, artificial lightweight aggregates made from expanding shale and coal fly ash were mixed in the same fresh concrete at the same volume ratio. The expanding shale type and fly ash type artificial aggregate contains glass phase of 60% and 80% respectively. On the other hand, sandstone aggregate does not contain any glass phase.

The surface areas of coarse aggregates curing 7 days, 28 days and 182 days were analyzed by optical microscopy and x-ray micro analysis. As the results, the thickness and shape of portlandite grown on the surface of sandstone aggregate were almost same between 28 days and 182 days. But the mean thickness of portlandite of 182 days grown on the artificial aggregates decreased comparing to that of 28 days. And shapes of the crystal changed at the different curing time. It is concluded that pozzolanic reaction between dissolved elements from glass and calcium from portlandite would occur, and that bonding force between artificial aggregate and the matrix would be bigger than that of sandstone.

**Submitted for consideration in the 2007 World of Coal Ash Conference, May 7-10, 2007.**