

AN ABSTRACT OF A THESIS

CHEMICAL AND MICROSTRUCTURAL CHARACTERISTICS OF THE ALKALI ACTIVATED REACTION BETWEEN BLAST FURNACE SLAG AND CALCIUM HYDROXIDE

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Master of Science in Chemical Engineering

The effect of alkali, sodium hydroxide, and waterglass ($\text{Na}_2\text{SiO}_3 \cdot 9\text{H}_2\text{O}$), on hydration rate and microchemistry of blast furnace slag (BFS) in the presence of calcium hydroxide (CH) was studied in this research. Samples were hydrated at 35 °C for between 1 and 32 d. The effect of alkali was studied by comparing TGA curves, SEM/ EDS and micro chemical analyses for the samples hydrated with distilled water (DW), 1 M sodium hydroxide (NaOH), and 3% by wt waterglass (WG) solutions. A similar study was also undertaken with the same alkaline solutions in the absence of BFS, which serve as control experiments. These controls help to better understand the chemical composition and micro structural characteristics of alkali activated BFS.

Thermo gravimetric analysis (TGA) and electron dispersive spectrometry (EDS) was used to calculate CH consumption, extent of reaction, and chemical composition of the hydrated samples. The presence of NaOH was found to retard CH consumption and WG was found to aggressively consume CH at hydration ages between 1 and 32 d.

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A Thesis

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by

Himabindu V. Gopiseti

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MASTER OF SCIENCE

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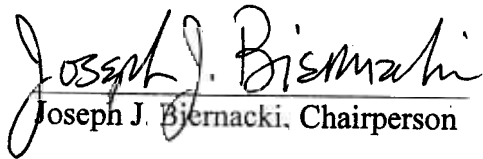
CERTIFICATE OF APPROVAL OF THESIS

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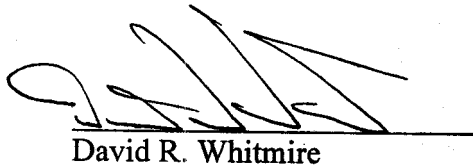
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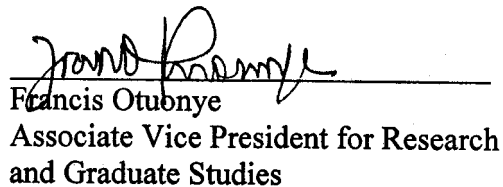

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