ABSTRACT

FABRICATION AND CHARACTERIZATION OF CALCIUM SILICATE CERAMICS USING RAW MATERIAL OF EGG SHELL AND SILICA COMMERCIAL WITH SOLID STATE REACTION TECHNIQUE

By

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In this research fabrication and characterization of calcium silicate ceramics by using raw material of egg shell and silica commercial with a solid state reaction technique was done. Sample of calcium silicate had been made from mixing egg shell powder and silica commercial using ethanol solvent as media. Sample then was sintered at temperature 1000 ^{o}C, 1100 ^{o}C, 1200 ^{o}C and 1300 ^{o}C. The characterization was conducted FTIR, SEM and XRD and also evaluation of physical testing such as density, porosity, shrinkage and resistivity. The objective of the result are the effect of heating temperature through characteristic various of bonds structure, structure of cristal and microstructure of calcium silicate samples. The heating treatment showed clearly the formation of calcium silicate applied at fourth temperature. FTIR characterization result showed that the carbonate bonds lost at temperature 1300 ^{o}C. SEM characterization was caused by four heating treatment that was apllied causing the grains began to unifying so that the grains have become big sizes, grain boundaries disappeared, pores that became small and occured micro cracking. The result of XRD characterization showed that the formation of calcium silicate phase occured at each temperature. Then evaluation of physical testing showed that if heating temperature that was applied in the sample was higher, it causes density, shrinkage and resistivity will be more increases. However porosity of calcium silicate was decreasesed, this was caused by density of sample that more increase.

Key words: calcium silicate, solid state reaction, FTIR, SEM, XRD, physical testing.