Siti Fitri Umroati: 2019. The Effect of Sintering Temperature on Polymorphic Formation of Tricalcium Phosphate (TCP) Based on Limestone and Phosphoric Acid. The Final Assignment is under the Guidance of JanAdy, S.Si., M.Si and Drs. Siswanto, M.Si., Physics Department, Faculty of Science and Technology, Airlangga University, Surabaya

ABSTRACT

The research has been conducted about the effect of sintering temperature on polymorphic formation of tricalcium phosphate based on limestone and phosphoric acid. Synthesis tricalcium phosphate was obtained from calcium hydroxide and phosphoric acid using the sol-gel method. The form of the gel that has been tested by TG-DSC so the effective temperature for sintering is obtained. The used sintering temperatures were 100˚C, 400˚C, 800˚C, and 1000˚C for 4 hours. Then, the sample was characterized through XRD test and FTIR test. The XRD results showed that sample of 1000˚C optimally produced 95.8% of β-tricalcium phosphate, 3.1% of α-tricalcium phosphate and 1.1% of hydroxylapatite with the degree of crystallization is equal to 88.96% and crystallite size is 40.33 nm. The FTIR results showed that a high degree of separation at a temperature of 1000˚C which identified PO_4^{3-} as characteristic of tricalcium phosphate.

Keywords: Polymorphic Tricalcium Phosphate, Sol-Gel, Sintering Temperature