The Effect of Calcination Temperature and Holding Time to The Growth of Nanosilica Crystal

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Abstract  
In this final project, the synthesis of nanosilica powder with coprecipitation method that calcinated with calcination temperature and holding time variation has been done. The basic material used in this final project is silica sand of Bancar beach, Tuban, East Java, Indonesia, that has been purified with precipitation method. The nanosilica was made by dissolving silica sand into 7M NaOH solution to form sodium silicate precursor. This precursor was titrated using 37% HCl to pH 7 then formed nanosilika. Nanosilika then calcined at a temperature of 900°C and 950°C with a holding time variation of 4, 6, 8, and 10 hours. Characterization was performed using X-ray Difractometer (XRD) and Differential Scanning Calorimetry-Thermogravimetric Analysis (TGA-DSC). And then the XRD’s result wasanalysed by using the software Match!. The analysis showed that the calcination with temperature of 900°C and 950°C can form the high cristobalite phase. High cristobalite phase increased with increasing holding time. The size of the nanosilica particle is ranging from 32,83 nm to 33,03 nm.

Keywords: nanosilica, calcination, coprecipitation method