ONE POT HYDROTHERMAL METHOD SYNTHESIZED AND CHARACTERIZED $NaFePO_4$ AS CATHODE MATERIAL FOR SODIUM ION BATTERY

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

ONE POT HYDROTHERMAL METHOD SYNTHESIZED AND CHARACTERIZED $NaFePO_4$ AS CATHODE MATERIALS FOR SODIUM ION BATTERY

Sodium iron phosphate ($NaFePO_4$) cathode material in a sodium ion battery was synthesized by a Polyethylene glycol (PEG) assisted by hydrothermal method. Besides, it is physical characterization was being analyzed by using Thermogravimetric Analysis (TGA), Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR), X-ray Diffraction (XRD) and Scanning Electron Microscope with Energy Dispersive X-ray Spectroscopy (SEM-EDS). After the sample was annealed at the furnace for 6 hours in the temperature 500°C, the dried powder will be run for analysis of TGA. That temperature was chosen as calcination temperature because the TGA curve becomes constant and no mass loss occur at temperature above this temperature. It indicates that the reaction was totally completed. In the ATR-FTIR analysis, the presence of iron phosphate in the sample was confirm by the peak at 555 cm^{-1} that indicate the bending vibrations of metal iron. Besides, cathode material can be analysed by XRD and it indicate the amorphous phase. Under magnification of SEM-EDS, the morphology of cathode material particles was observed in heterogeneous and a lot of particles aggregiation.