



## **SINTESIS MAGNETIT ( $\text{Fe}_3\text{O}_4$ ) DALAM LEMBAR KOMPOSIT PVA-LEMPUNG ALAM**

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### **INTISARI**

Magnetit telah disintesis di dalam lembar komposit polivinil alkohol (PVA)-lempung alam. Magnetit dibentuk melalui kopresipitasi sol  $\text{Fe}(\text{OH})_2$ . Reaksi kopresipitasi dilangsungkan dalam campuran PVA dan lempung alam dalam air. Jumlah garam besi sulfat divariasi untuk menghasilkan jumlah magnetit yang berbeda. Pengaruh jumlah prekursor besi (II) sulfat terhadap kemungkinan terbentuknya magnetit dan terhadap sifat magnetiknya diselidiki dalam penelitian ini. Terbentuknya magnetit dalam lembar komposit dikenali melalui difraksi sinar-X pada lembar komposit. Kestabilan magnetit dilihat dari ukuran kristalit magnetit yang dihitung berdasarkan pelebaran puncak pada difraktogram. Sifat-sifat magnetik juga berkaitan erat dengan ukuran kristalit magnetit. Sifat-sifat tersebut diukur menggunakan *vibrating sample magnetometer* (VSM). Interaksi kimiawi di dalam lembar komposit dilihat dengan bantuan spektrometer infra merah.

Magnetit hanya terbentuk pada jumlah garam besi  $\geq 1$  mmol sedangkan pada jumlah di bawah itu terbentuk oksida besi yang berbeda. Ukuran magnetit yang terbentuk berkisar antara 17-18 nm. Berdasarkan pengukuran VSM, magnetisasi jenuh dan remanensi lembar komposit meningkat. Lembar komposit yang mengandung magnetit di dalamnya memiliki nilai perbandingan antara remanensi terhadap magnetisasi jenuh yang tetap yaitu 0,39.

Kata kunci: lembar komposit, magnetit, PVA



## **MAGNETITE SYNTHESIS IN PVA-NATURAL CLAY COMPOSITE SHEET**

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### **ABSTRACT**

Magnetite has been synthesized in a polyvinyl alcohol (PVA)-natural clay composite film. Magnetite was coprecipitated from  $\text{Fe}(\text{OH})_2$  sol. The reaction occurred in an aqueous mixture of PVA and natural clay. The different amount of magnetite was yielded through varying the amount of ferrous precursor. This research focused on magnetite formation in the composite sheet and the magnetic properties of the sheet. The presence of magnetite in the composite was examined with X-ray diffraction. Stability of magnetite was judged from its crystallite size which can be calculated from peak broadening with Scherrer's equation. Magnetic properties were used to describe the stability of magnetite. Magnetic properties measurement were conducted with vibrating sampel magnetometer (VSM). Generally, chemical bonds inside the composed were examined with infrared spectrometer.

Magnetite was formed in composite which consist of  $\geq 1$  mmol ferrous precursor. In the other hand, magnetite was not formed below that value. The size of magnetite crystalite was ranging from 17-18. The increment of ferrous amount also increased the value saturated magnetization and remanence. The ratio of remanence to saturated magnetization of magnetite containing composite sheet is 0.39.

Keyword: composite film, magnetite, PVA