

ABSTRACT

The raw material for permanent magnets barium ferrite (BaFe) is very abundant in Indonesia. In this study, BaFe was combined with NdFeB (hybrid) using PVA and CMC matrices as bonded to obtain better mechanical and magnetic properties than pure BaFe. In this study, the composition of BaFe / NdFeB and the concentration of PVA and CMC matrices were varied to study the trends of the hybrid mechanical and magnetic properties. The variation of BaFe / NdFeB composition were 7: 3, 5: 5, and 3: 7 with total mass of 2,5 grams. In addition, each PVA or CMC matrix was varied at a concentration of 0,1 wt%, 1 wt%, and 2 wt%. The mechanical properties characterization includes particle distribution image, density calculation, and compressive strength measurement. The magnetic properties are studied by measuring the remanence (Br), coercivity (Hc) and maximum energy product (BHmax). The results showed that the addition of NdFeB increase the density with highest density of 5,1 g/cm³, the magnetic remanence also increase with the average increase of 1 kG for each addition of wt% and also increase the compressive strength of BaFe/NdFeB hybrid sample. The addition of matrix concentration, for both PVA and CMC, decreases the sample density and magnetic remanence. However, the compressive strength were observed directly proportional to the addition of matrices concentration.

Keywords: hybrid BaFe/NdFeB, PVA, CMC, matrix, composition of variation, mechanical properties, magnetic properties