

# Efek substitusi Ti ( $x=0, 0.1, 0.15, 0.2$ ) pada parameter kristal dan morfologi bahan $\text{La}_{0.85}\text{Ba}_{0.15}\text{Mn}_{(1-x)}\text{Ti}_x\text{O}_3$ = Substitution effect of Ti ( $x=0, 0.1, 0.15, 0.2$ ) on crystal parameter and morphology of the $\text{La}_{0.85}\text{Ba}_{0.15}\text{Mn}_{(1-x)}\text{Ti}_x\text{O}_3$ compound

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## Abstrak

Penelitian efek substitusi Ti pada paduan  $\text{La}_{0.85}\text{Ba}_{0.15}\text{Mn}_{(1-x)}\text{Ti}_x\text{O}_3$  ( $x = 0, 0.1, 0.15, \text{ and } 0.2$ ) dipersiapkan dengan metode mechanical milling selama 25 jam, suhu kalsinasi sebesar  $800^\circ\text{C}$  selama 10 jam dan suhu sintering  $1200^\circ\text{C}$  selama 12 jam berdasarkan hasil uji TGA dan DSC. Kurva XRD (X-Ray Diffraction) menunjukkan fasa tunggal, sistem kristal monoklinik dengan group ruang (space group) 'I 1 2/c 1' pada suhu ruang. Terdapat kenaikan pada parameter kisi, volum unit sel, dan ukuran kristalit rata-rata dengan meningkatnya substitusi Ti. Hasil SEM (Scanning Electron Microscopy) menunjukkan morfologi bahan, distribusi ukuran partikel dan porositas pada paduan. Ukuran partikel rata-rata paduan didapatkan dengan menggunakan Particle Size Analyzer (PSA). Rata-rata ukuran partikel meningkat setelah mendapatkan perlakuan pemanasan sintering.

.....Research on the effect of titanium substitution on the structure and the particle morphology characterization of manganites with  $\text{La}_{0.85}\text{Ba}_{0.15}\text{Mn}_{(1-x)}\text{Ti}_x\text{O}_3$  ( $x = 0, 0.1, 0.15, \text{ and } 0.2$ ) was carried out. Materials were prepared by using a mechanical milling method for 25 hours. The calcination and sintering temperatures attained based on TGA and DSC results were  $800^\circ\text{C}$  for 10 hours and  $1200^\circ\text{C}$  for 12 hours. X-ray diffraction patterns of the width  $\text{La}_{0.85}\text{Ba}_{0.15}\text{Mn}_{(1-x)}\text{Ti}_x\text{O}_3$  ( $x = 0, 0.1, 0.15, \text{ and } 0.2$ ) showed single phase, monoclinic system and space group 'I 1 2/c 1' at room temperature. Lattice parameters, volume unit cell, and mean crystallite size increased along with increases in Ti substitution. Scanning electron microscopy (SEM) showed the morphology, surface, distribution of particle size, and porosity of the compound. The mean particle size of the obtained compounds was determined by using a Particle Size Analyzer. Mean particle size increased after the use of the sintering process.