

Kinetika pertumbuhan kristal barium heksaferit di substitusi Mn-Ti melalui proses pemaduan mekanik = Crystal growth kinetics of barium hexaferrite substituted by Mn-Ti derived from mechanical alloying process

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Abstrak

Penelitian tentang kinetika pertumbuhan kristal barium heksaferit disubstitusi Mn dan Ti dengan komposisi BaFe_{9.6}Ti_{1.2}Mn_{1.2}O₁₉ yang dibuat melalui proses pemaduan mekanik telah dilakukan. Ukuran kristal rata-rata BaFe_{9.6}Ti_{1.2}Mn_{1.2}O₁₉ didapat dengan metode Whole Powder Pattern Modeling (WPPM) pada software PM2K. Ukuran kristal bertambah secara bertahap dan akhirnya mencapai ukuran maksimum. Dari pemanasan isothermal, kinetika pertumbuhan kristal dapat dijelaskan oleh persamaan Avrami dengan energi aktivasi pertumbuhan kristal $Q = 51,76$ kJ/mol.

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A study on the kinetics of crystal growth of barium hexaferrite substituted by Mn and Ti with composition BaFe_{9.6}Ti_{1.2}Mn_{1.2}O₁₉ produced by mechanical alloying was carried out. The grain size of BaFe_{9.6}Ti_{1.2}Mn_{1.2}O₁₉ was estimated by the Whole Powder Pattern Modeling (WPPM) in PM2K software. The grain size increases gradually, and finally ceases to reach an ultimate value regardless of annealing time. From isothermal anneals, the grain growth kinetics can be described by Avrami's equation and activation energy for grain growth Q has been determined to be 51,76 kJ/mol.