The Magnetic, Absorption and Structure Properties of Zn-Ti Substituted Barium Hexaferrite Prepared by Solid-State Reaction

Publons ID	48070633
Wos ID	WOS:000558064600025
Doi	10.1063/5.0001799
Title	The Magnetic, Absorption and Structure Properties of Zn-Ti Substituted Barium Hexaferrite Prepared by Solid-State Reaction
First Author	
Last Author	
Authors	Nainggolan, AN; Widanarto, W; Adi, WA;
Publish Date	2020
Journal Name	PROCEEDINGS OF THE 3RD INTERNATIONAL SEMINAR ON METALLURGY AND MATERIALS (ISMM 2019): EXPLORING NEW INNOVATION IN METALLURGY AND MATERIALS
Citation	
Abstract	The electronic devices currently become increased and it makes the electromagnetic waves in the microwave radiation more dispersed in the environment and the amount of radiation needed to be reduced. Therefore, it has developed technology for microwave radiation absorption by using specific types of material. One of the magnetic materials that has been developed at this time is magnetic material barium hexaferrite. This material has the advantage among others, the high value of coercivity (Hc) and magnetic saturation (Ms), the high transition temperature (Tc = curie temperature), stable chemical properties and corrosion resistance. The material was very suitable for electronic recording media, electromagnetic interference, magnetic liquids, and microwave absorbing devices. Zn-Ti doped barium ferrite material as an absorber microwaves and belong to soft magnetic type has been successfully fabricated using solid-state reaction method with composition where BaFe12-2xZnxTixO19 x = 0; 0.2; 0.4; 0.6; 1.0 in wt.%. The solid reaction method consists of co-precipitation, mixing process, compaction, calcination at temperature 750 degrees C for 7 h and sintering at temperature 1000 degrees C for 4 h. XRD, SEM-EDS, VSM, and VNA characterizations are conducted to analysis structure, composition and surface morphology, magnetic properties and microwave absorption, respectively. The results show that BaFe12O19 phases are formed with hexagonal structures. Meanwhile, remanent magnetization (Mr) decreases with increasing concentration of Zn-Ti from 55 emu/g to 35 emu/g. The highest microwave absorption i.e. 36 dB has occurred at frequency 13.9 GHz with addition 0.2 wt.% of Zn-Ti. Generally, the addition of Zn-Ti concentration in the mixture of barium ferrite affects the structural and magnetic properties. This magnetic material is very promising for microwave absorption applications.
Publish Type	Book in series
Publish Year	2020
Page Begin	(not set)
Page End	(not set)
Issn	0094-243X
Eissn	
Url	https://www.webofscience.com/wos/woscc/full-record/WOS:000558064600025
Author	Dr R WAHYU WIDANARTO, S.Si, M.Si