Judul Artikel : Synthesis and Characterization of Barium Hexaferrite with

Manganese (Mn) Doping Material as Anti-Radar

Penulis : Susilawati, Aris Doyan, dan Khalilurrahman

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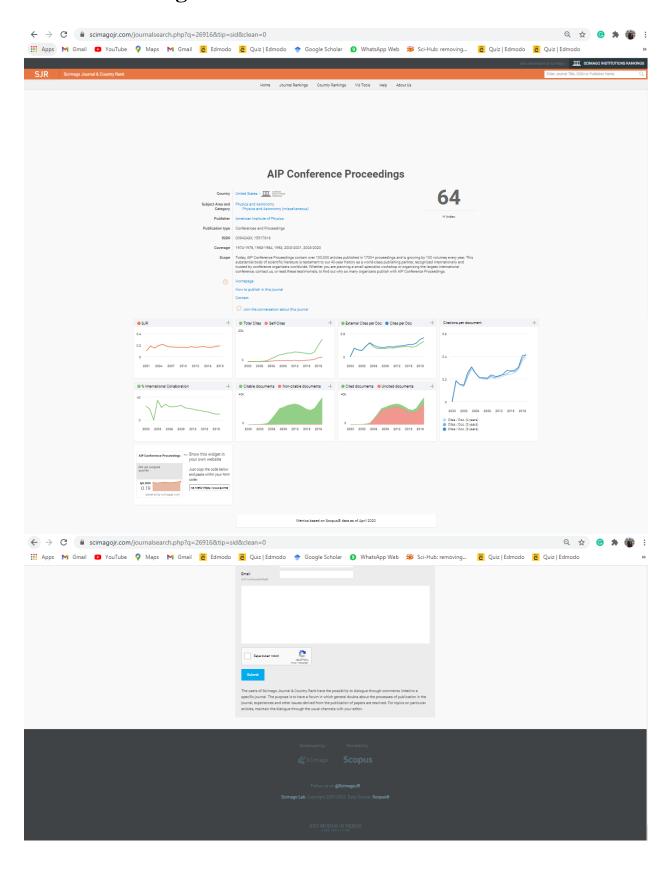
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Synthesis and characterization of barium hexaferrite with manganese (Mn) doping material as anti-radar

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Susilawati, Aris Doyan, and Khalilurrahman





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Synthesis and Characterization of Barium Hexaferrite with Manganese (Mn) Doping Material as Anti-Radar

Susilawatia), Aris Doyanb), Khalilurrahmanc)

Department of Physics Education, University of Mataram, Lombok, West Nusa Tenggara, 83125 Indonesias.

a)Corresponding author: susilawatihambali@yahoo.co.id b)arisdoyan @yahoo.co.id c)khalil.ong06@gmail.com

Abstract. Have been successfully synthesized barium powder doping Manganese hexaferrite with the expected potential as anti-radar material. Synthesis was done by using the co- precipitation method, the variation of the variable x concentrations used were 0; 0.2; 0.4; and 0.6 and calcined at temperatures of 400, 600 and 800°C. Characterization powders of hexaferrite have used XRD (X-Ray Diffraction), SEM (Scanning Electron Microscopy), TEM (Transmission Electron Microscopy), LCR (inductance, capacitance, and resistance) meter, and VSM (Vibrating Sample Magnetometer). The higher the concentration and temperature of calcinations given affect the color of the powder. The test results using XRD indicates that it has formed barium hexaferrite phase with a hexagonal crystal structure. Tests using SEM showed that all the constituent elements barium powder hexaferrite by doping Manganese powders have been spread evenly. XRD test results were confirmed by a test using a TEM showing the crystal structure and the powder was sized nano particles. The results from the LCR meter showed that the barium powder hexaferrite by doping Manganese that has been synthesized classified in semiconductor materials. The result from VSM showed that the value of coercivity magnetic powder doped barium hexaferrite Manganese is smaller when compared with barium hexaferrite without doping and belong to the soft magnetic. Based on the results of the synthesis and characterization, we can conclude that the barium powder heksaferrite by doping Manganese potential as a material anti-radar.

INTRODUCTION

Radar absorbing materials (RAM) are classified into two i.e the material of a dielectric and the material of the magnetic. The microwave-absorbing materials can be used to minimize the electromagnetic reflection from the metal plate such as aircrafts, ships, tanks, and electronic equipment. Barium hexaferrite is large magneto crystalline anisotropy, high Curie temperature, relatively large magnetization, excellent chemical stability, and corrosion resistivity [1]. M-type barium hexaferrite with hexagonal molecular structure BaFe₁₂O₁₉ (Ba ferrite) is a promising material for permanent magnet, advanced recording, and microwave absorbing. The hexagonal barium hexaferrite (BaFe₁₂O₁₉) is known as a hard magnetic material with high coercivity and large saturation magnetization. It is used in high frequency microwave technology, magnetic recording media and as a permanent magnetic material [2]. Nano-sized ferrite particles can be obtained by various ways, such as, co-precipitation method, micro emulsion techniques and decomposition of organo-metallic compounds. Co-precipitation has a simple synthesis route and can be prepared on a large scale of products. It is one of the techniques used frequently for preparation of nano sized particles [3]. The co-precipitation allows one to vary the average size of nano particles by adjusting the pH and the temperature of the aqueous media, but one has only limited control over the particles size distribution [4]. The doped hexaferrites show that the saturation magnetization decreases slightly and coercivity decreases dramatically with increasing doping content. It is suggested that a combination of dopants can be used to control or to reduce the coercivities with only a small change of their saturation magnetizations. Thus, the substitutions of Fe ions by isovalent cations can be generally investigated BaM constituent element iron can be replaced by other metal cations from the group of transition which has almost the same size as Co, Zn, Ni and Mn [5]. This study concentrates

E-mail dengan ICTAP 2016

LOA The 6th ICTAP INDONESIA

Dari: ictap2016@science.unhas.ac.id

Kepada: susilawatihambali@yahoo.co.id

Tanggal: Rabu, 10 Agustus 2016 11.44 WITA

Dear Participant of The 6th ICTAP 2016.

On behalf of the Scientific Committee, we are pleased to inform you that your abstract entitled "Synthesis and Characterization of Barium Heksaferrite with Metal Manganese (Mn) Doping Material as Anti-Radar" has been accepted for an ORAL presentation at The 6th International Conference on Theoretical and Applied Physics (The 6th ICTAP) 2016 which will be held in Hasanuddin University Makassar INDONESIA from 19 – 21 September 2016. The instruction of the oral presentation is attached below, which is also available in the conference website together with the schedule of programs, http://www.unhas.ac.id/fisika/ictap6.php. For the The 6th ICTAP book program, please complete your abstract especially the red mark in the attached file. Please send back the revised version of your abstract to the 6th ICTAP committee through email; ictap2016@science.unhas.ac.is no later than August 18, 2016. Thank you for your cooperation and we waiting your revised abstract as soon as possible

Best Regards Dahlang Tahir Chairman of 6th ICTAP 2016



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The 6th International Conference on Theoretical and Applied Physics & National Physics Symposium XXIX - "Physics for Future Development of Science and Technology"

Makassar, September 19"-21", 2016

August 10th, 2016

Dear Mr/Mrs. Susilawati

On behalf of the Scientific Committee, we are pleased to inform you that your abstract entitled "Synthesis and Characterization of Barium Heksaferrite with Metal Manganese (Mn) Doping Material as Anti-Radar" has been accepted for an ORAL presentation at The 6th International Conference on Theoretical and Applied Physics (The 6th ICTAP) 2016 which will be held in Hasanuddin University Makassar INDONESIA from 19 – 21 September 2016. The instruction of the oral presentation is attached below, which is also available in the conference website together with the schedule of programs, http://www.unhas.ac.id/fisika/ictap6.php.

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We also appreciate if you could do the payment of the conference registration in advance by bank transfer and make confirmation by sending us the copy of your transfer proof.

Should you have any inquiry, please feel free to contact us. We thank you very much for your contribution in this conference and look forward to seeing you in Makassar.







The 6" International Conference on Theoretical and Applied Physics & National Physics Symposium XXIX - "Physics for Future Development of Science and Technology"

Makassar, September 19"-21", 2016

August 25th, 2016

Dear Dra. Susilawati, M.Si., Ph.D Sekretaris Program Studi Magister IPA Universitas Mataram

On behalf of the Scientific Committee, we are pleased to inform you that your abstract entitled "Synthesis and Characterization of Barium Hexaferrite with Metal Manganese (Mn) Doping Material as Anti-Radar" has been accepted for an ORAL presentation at The 6th International Conference on Theoretical and Applied Physics (The 6th ICTAP) 2016 which will be held in Hasanuddin University Makassar INDONESIA from 19 – 21 September 2016. The instruction of the oral presentation is attached below, which is also available in the conference website together with the schedule of programs, http://www.unhas.ac.id/fisika/ictap6.php.

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The 6th International Conference on Theoretical and Applied Physics & National Physics Symposium XXIX - "Physics for Future Development of Science and Technology"

Makassar, September 19"-21", 2016

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(The completed form and revised abstract should be sent to the organizer by email)

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Email :			
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Welcome Reception (September 19 th 2016)*	Atten	d 🗆	Not attend
Banquet Dinner (Septen 20th 2016)*	nber Atten	d 🗆	Not attend







POSTER & ORAL PRESENTATION INSTRUCTION

POSTER (FOR STUDENT)

- Poster should be simple, brief and prepared having in minds, primarily, their use as a basis for
 the presentation, use graphs/charts where appropriate and stand out by using solid colors for
 lines or bars. The poster requirement will be A0 size and portrait.
- The poster presenters have to confirm their appearance to the secretariat during th time and then hanging the poster from morning Tuesday, September 20th.
- All posters should be display during conference where Poster Presentation will be held in
 poster session, Tuesday, September 20th. The presenting author(s) must be close to their
 poster during all the period assigned, and are expected to be available for questions at posters
 session.
- The poster can be removed from the board after poster session done.

ORAL

- Presentation slide should contain an introduction of the main idea of your work, main body of the experimental results and the conclusion. Make sure your presentation simple, i.e. easy to be understood.
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- Presentation slide must be delivered to the secretariat or directly on the person in charge in session room (recommended 30 minutes before presentation).
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Dari: ictap2016@science.unhas.ac.id Kepada: susilawatihambali@yahoo.co.id

Tanggal: Minggu, 28 Agustus 2016 11.43 WITA

Dear Drs Susilawaty, M.Si., Ph.D. Secretary magister science education Matara University,

Please find new LOA in attached file

Sincerely Yours

Dahlang Tahir Chairman of The 6th ICTAP 2016

Mohon maaf

Dari: ictap2016@science.unhas.ac.id

Kepada: susilawatihambali@yahoo.co.id

Tanggal: Senin, 29 Agustus 2016 08.30 WITA

Kepada Yth Ibu Dra. Susilawati, M.Si., Ph.D

Assalamu'alaikum wr.wb,.

Kami atas nama ketua panitia mohon maaf atas kesalahan kami mencantumkan judul lain dari judul materi Ibu.

Kami kirimkan kembali LOA yang baru. Sekali lagi kami mohon maaf. Jika ada hal yang Ibu butuhkan terkait dengan konference silahkan hubungi kami. Dengan senang hati kami siap membantu.

Wassalam

Dahlang Tahir

On 2016-08-28 15:24, Susilawati Hambali wrote:

- > Kepada Yth
- >
- > Ketua Konferensi ICTAP 2016
- > Saya memohon kepada bapak untuk mengundang saya pada acara konferensi
- > dengan alamat sebagai sekretaris program studi magister IPA
- > universitas Mataram dengan judul artikel saya :
- > Synthesis and Characterization of Barium Hexaferrite with Metal
- > Manganese (Mn) Doping Material as Anti-Radar

>

- > surat undangan ini saya perlukan untuk SPPD dari unram. terimakasih.
- >
- > maaf surat undangan yang telah dikirimkan kepada saya sebagai
- > sekretaris program studi magister IPA universitas Mataram hari ini
- > salah judulnya.
- >
- > wasalam,
- > Dra. Susilawati, M.Si., Ph.D



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Re: Artikel an. Susilawati Universitas Mataram Revisi

Dari: ictap@fisika.or.id

Kepada: susilawatihambali@yahoo.co.id
Tanggal: Senin, 28 Agustus 2017 22.07 WITA

Is this abstract the newest one?

We have already submit your full paper which sent by Dr. Aris Doyan. The author could also check the submission by login to

https://conference.fisika.or.id/users/login

You could also modify your paper (add the revised full paper or delete the wrong version).

Thank you

ICTAP Committee

Re: Bukti pembayaran ICTAP 2016

Dari: ictap2016@science.unhas.ac.id Kepada: susilawatihambali@yahoo.co.id

Tanggal: Jumat, 2 September 2016 10.20 WITA

Terima kasih atas informasinya

Sampai ketemu di Makassar

On 2016-09-02 09:32, Susilawati Hambali wrote:

- > Assalamualaikum Wr, Wb,
- > Yth. Bapak Dr.Dahlang Tahir
- > Kami berdua atas nama Aris Doyan dan Susilawati telah melakukan
- > pembayaran untuk semiar ICTAP 2016 melalui no rekening BTN yang telah
- > diberikan pada email kami yang berisi LOA dll. Bukti pembayaran saya
- > lampirkan di email ini , terimakasih.
- >
- > Wassalam
- >
- > Susilawati
- >
- >
- >

susilawati Agreement AIP

Dari: Susilawati Hambali (susilawatihambali@yahoo.co.id)

Kepada: ictap2016@science.unhas.ac.id

Cc: arisdoyan@yahoo.co.id

Tanggal: Sabtu, 19 November 2016 09.13 WITA



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Dari: Aris Doyan (arisdoyan@yahoo.co.id)

Kepada: ictap2016@science.unhas.ac.id

Cc: susilawatihambali@yahoo.co.id

Tanggal: Minggu, 30 Oktober 2016 11.21 WITA

Kepada Yth.

Bapak Prof. Dr. Dahlang Tahir

Dengan hormat. Bersama surat ini saya doakan bapak selalu sehat wal'afiat dan tidak kurang satu apapun. Pak Prof. Dahlang, saya sudah perbaiki artikel saya sesuai format AIP. Jika ada terdapat kekurangan mohon di informasikan kembali dan saya bersedia untuk perbaiki lagi. terimakasih atas bantuan bapak dan saya senang sekali pergi ke kota makasar karena perjalanan pertama saya ke sana.

wasalam,

Aris Doyan.



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Terima kasih atas informasinya
Sampai ketemu di Makassar
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> diberikan pada email kami yang berisi LOA dll. Bukti pembayaran saya
> lampirkan di email ini , terimakasih.
> Wassalam
> Susilawati
> Pada Sen, 29/8/16, ictap2016@science.unhas.ac.id
> < ictap2016@science.unhas.ac.id> menulis:
> Judul: Mohon maaf
> Kepada: "Susilawati Hambali" <susilawatihambali@yahoo.co.id>
> Tanggal: Senin, 29 Agustus, 2016, 8:25 AM
> Kepada Yth Ibu Dra.
  Susilawati, M.Si., Ph.D
> Assalamu'alaikum wr.wb,.
> Kami atas nama ketua panitia
> mohon maaf atas kesalahan kami mencantumkan
> judul lain dari judul materi Ibu.
> Kami kirimkan kembali LOA yang
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> ada
> hal yang Ibu butuhkan terkait dengan konference silahkan
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> kami. Dengan senang hati kami siap
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> membantu.
> Wassalam
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> > Manganese (Mn)
> Doping Material as Anti-Radar
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> SPPD dari unram. terimakasih.
> > maaf surat undangan yang telah dikirimkan
> kepada saya sebagai
> > sekretaris program
> studi magister IPA universitas Mataram hari ini
> > salah judulnya .
> > wasalam,
> > Dra.
> Susilawati, M.Si., Ph.D
```

Revisied my abstract

28/1/2021

Dari: Susilawati Hambali (susilawatihambali@yahoo.co.id)

Kepada: ictap2016@science.unhas.ac.id Tanggal: Senin, 22 Agustus 2016 11.18 WITA

thank you very much for accepting me as a participant presentations on ICTAP 2016. I resubmit an amended abstract repair. apologize for the delay this abstract repair.

Best regard

Dra.Susilawati, M.Si., Ph.D



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Re: permohonan surat undangan konferensi

Dari: ictap2016@science.unhas.ac.id
Kepada: susilawatihambali@yahoo.co.id

Tanggal: Minggu, 28 Agustus 2016 11.43 WITA

Dear Drs Susilawaty, M.Si., Ph.D. Secretary magister science education Matara University,

Please find new LOA in attached file

Sincerely Yours

Dahlang Tahir Chairman of The 6th ICTAP 2016

On 2016-08-28 07:41, Susilawati Hambali wrote:

> Mataram, August 28 2016

> To the honorable chairman ICTAP 2016.

> In connection with the acceptance of me as the conference participants

> with entitled " Synthesis and characterization of Barium Heksaferrite

> with Metal Manganese (Mn) Doping Material as Anti - Radar " has been

> accepted for an ORAL presentation at The 6th International Conference

> on Theoretical and Applied Physics (The 6th ICTAP) 2016 the which

> will be held in Hasanuddin University Makassar INDONESIA from 19 to 21

> September, 2016.

I was serving as secretary of magister science education program

> graduate. Furthermore, I request the conference call letter addressed

> to me as secretary magister science education to can apply for a

> permit rector mataram university for the departure.

> Best Regard

> Dra. Susilawati, M.Si., Ph.D

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LOA The 6th ICTAP INDONESIA

Dari: ictap2016@science.unhas.ac.id

Kepada: susilawatihambali@yahoo.co.id

Tanggal: Rabu, 10 Agustus 2016 11.44 WITA

Dear Participant of The 6th ICTAP 2016.

On behalf of the Scientific Committee, we are pleased to inform you that your abstract entitled "Synthesis and Characterization of Barium Heksaferrite with Metal Manganese (Mn) Doping Material as Anti-Radar" has been accepted for an ORAL presentation at The 6th International Conference on Theoretical and Applied Physics (The 6th ICTAP) 2016 which will be held in Hasanuddin University Makassar INDONESIA from 19 – 21 September 2016. The instruction of the oral presentation is attached below, which is also available in the conference website together with the schedule of programs, http://www.unhas.ac.id/fisika/ictap6.php. For the The 6th ICTAP book program, please complete your abstract especially the red mark in the attached file. Please send back the revised version of your abstract to the 6th ICTAP committee through email; ictap2016@science.unhas.ac.is no later than August 18, 2016. Thank you for your cooperation and we waiting your revised abstract as soon as possible

Best Regards Dahlang Tahir Chairman of 6th ICTAP 2016



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Reviewer and Editor comment

Dari: ictap2016@science.unhas.ac.id

Kepada: susilawatihambali@yahoo.co.id

Tanggal: Kamis, 27 Oktober 2016 09.58 WITA

Yth. Ibu Susilawati,

Mohon maaf, kami baru terima hasil koreksi reviewer. Papernya minor revison.

MOHON DIPERHATIKAN FORMAT AIP TIDAK 2 COLUMN HANYA 1 COLUMN.

MOHON DIGANTI KE 1 COLUMN dan TIDAK ADA TULISAN NAMA CONFERENCE FOOTNOTE ATAU HEADER

Revisi segera seuai format dan kemblikan ke kami setelah itu saya akan kirimkan TCA dari AIP jika reviewer setuju yang telah diperbaiki.

Wassalam

Panitia

>>

```
On 2016-10-25 17:34, Susilawati Hambali wrote:
> Assalamuaalikum, Wr.Wb

    > Pak Prof Dahlang Tahir, mohon maaf mengganggu, saya Susilawati dari
    > Universitas Mataram, Lombok peserta conference ICTAP 2016 ingin

> menanyakan tentang makalah yang saya presentasikan apakah ada
> perbaikan, maaf sebelumnya jika saya lancang, terimakasih.
> Wassalam
> Susilawati
> Pada Selasa, 13 September 2016 8:47, "ictap2016@science.unhas.ac.id"
> < ictap2016@science.unhas.ac.id> menulis:
> Dear Participant,
> Venue for the conference is GEDUNG IPTEKS, Hasanuddin University:
https://www.google.co.id/maps/place/Gedung+IPTEKS+UNHAS/@-5.1368521,119.4868491,737m/data=l3m1!1e3!4m5
!3m4!1s0x2dbefcb4bf9f75a7:0xab2817d1d456992!8m2!3d-5.1361575!4d119.4890163
>[1]
> With warm regards
> Dahlang Tahir
> Chairman of The 6th ICTAP Makassar Indonesia
> On 2016-09-09 15:06, ictap2016@science.unhas.ac.id wrote:
>> Yth: Peserta The 6th ICTAP
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>> Sebelumnya Kami atas nama panitia The 6th ICTAP memohon maaf kepada
>> seluruh peserta karena adanya perubahan jadwal kegiatan IPS meeting,
>> welcome dinner, dan banquet dinner yang sebelumnya tertulis grand >> imawan dipindahkan ke Hotel Dalton (ex-grand city). Kami mohon
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>> di hotel grand imawan kepada kami. Data ini kami butuhkan untuk
>> penjemputan peserta dari grand imawan ke tempat kegiatan dan
>> sebaliknya.
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'Continue Here

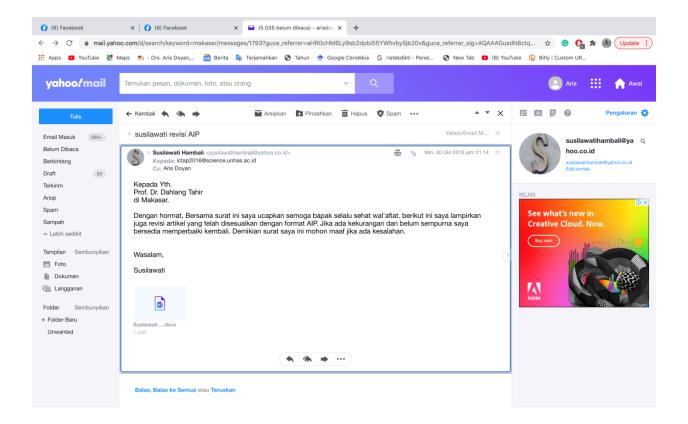
* Email: corresponding_author@email.address.com

ABSTRACT

Have been successfully synthesized barium powder metal doping Manganese heksaferrite with the expected potential as anti-radar material. Synthesis is done by using the coprecipitation method, the variation of the variable x concentrations used were 0; 0.2; 0.4; and 0.6 and calcined at temperatures of 400, 600 and 800 gC. Furthermore in characterization powder using XRD (X-Ray Diffraction), SEM (Scanning Electron Microscopy), TEM (Transmission Electron Microscopy), LCR (inductance, capacitance, and resistance) meter, and VSM (Vibrating Sample Magnetometer). Synthesis of barium powder metal doping Manganese heksaferrite with a brown color. The higher the concentration and temperature of calcination given affect the color of the powder. The test results using XRD indicates that it has formed barium heksaferrite phase with a hexagonal crystal structure. Tests using SEM showed that all the constituent elements barium powder heksaferrite by doping Manganese metal powders have been spread evenly. XRD test results were confirmed by a test using a TEM showing the crystal structure and the powder was sized nano particles. The test results using the LCR meter shows that the barium powder heksaferrite by doping Manganese metal that has been synthesized classified in semiconductor materials. Last testing the use VSM shows the value of coercivity magnetic powder doped barium heksaferrite Manganese metal is smaller when compared with barium heksaferrite without doping and belong to the soft magnet. Based on the results of the synthesis and characterization, we can conclude that the barium powder heksaferrite by doping Manganese metal potential as a material anti-radar.

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