Your Paper's Title Starts Here: Please Center  
use Helvetica (Arial) 14

Full First Author1, a \***,** Full Second Author2,b and Full Last Author3,c

1Full address of first author, including country

2Full address of second author, including country

3List all distinct addresses in the same way

aemail, bemail, cemail

\* please mark the corresponding author with an asterisk

**Keywords:** List the keywords covered in your paper. These keywords will also be used by the publisher to produce a keyword index.

***For the rest of the paper, please use Times Roman (Times New Roman) 12***

**Abstract.** This template explains and demonstrates how to prepare your camera-ready paper for *Trans Tech Publications*. The best is to read these instructions and follow the outline of this text.

Please make the page settings of your word processor to A4 format (21 x 29.7 cm or 8 x 11 inches); with the margins: bottom 1.5 cm (0.59 in) and top 2.5 cm (0.98 in), right/left margins must be 2 cm (0.78 in).

**We will be able to publish your paper in electronic form on our web page** <http://www.scientific.net> **if the paper format and the margins are correct.**

Your manuscript will be reduced by approximately 20% by the publisher. Please keep this in mind when designing your figures and tables, etc.

Introduction

All manuscripts must be in English, also the table and figure texts, otherwise, we cannot publish your paper.

Please keep the second copy of your manuscript in your office. When receiving the paper, we assume that the corresponding authors grant us the copyright to use the paper for the book or journal in question. Should authors use tables or figures from other Publications, they must ask the corresponding publishers to grant them the right to publish this material in their paper.

Use *italic* for emphasizing a word or phrase. Do not use boldface typing or capital letters except for section headings (cf. remarks on section headings, below).

Organization of the Text

**Section Headings.** The section headings are in boldface capital and lowercase letters. Second level headings are typed as part of the succeeding paragraph (like the subsection heading of this paragraph).

**Page Numbers.** Do *not* number your paper:

**Tables.** Tables (refer with: Table 1, Table 2, ...) should be presented as part of the text, but in such a way as to avoid confusion with the text. A descriptive title should be placed above each table. Units in tables should be given in square brackets [meV]. If square brackets are not available, use curly {meV} or standard brackets (meV).

**Special Signs**. For example, α γ μ Ω () ≥ ± ● Γ {110} should always be written in with the fonts Times New Roman or Arial, especially also in the figures and tables.

**Macros**. Do not use any macros for the figures and tables. (We will not be able to convert such papers into our system)

**Language**. All text, figures and tables must be in English.

**Figures.** Figures (refer with: Fig. 1, Fig. 2, ...) should be presented as part of the text, leaving enough space so that the capt­ion will not be confused with the text. The caption should be self-contained and placed *below or beside* the figure. Generally, only original drawings or photographic reproductions are acceptable. Only very good photocopies are acceptable. Utmost care must be taken to *insert the figures in correct alignment with the text*. Half-tone pictures should be in the form of glossy prints. If possible, please include your figures as graphic images in the electronic version. For best quality, the pictures should have a resolution of 300 dpi (dots per inch).

Color figures are welcome for the online version of the journal. Generally, these figures will be reduced to black and white for the print version. Authors should indicate on the checklist if they wish to have them printed in full color and make the necessary payments in advance.

**Equations.** Equations (refer with: Eq. 1, Eq. 2, ...) should be indented 5 mm (0.2"). There should be one line of space above the equation and one line of space below it before the text continues. The equations have to be numbered sequentially, and the number put in parentheses at the right-hand edge of the text. Equations should be punctuated as if they were an ordinary part of the text. Punctuation appears after the equation but before the equation number. The use of Microsoft Equation is allowed.

c2 = a2 + b2. (1)

Literature References

References are cited in the text just by square brackets [1]. (If square brackets are not available, slashes may be used instead, e.g. /2/.) Two or more references at a time may be put in one set of brackets [3, 4]. The references are to be numbered in the order in which they are cited in the text and are to be listed at the end of the contribution under the heading *References*, see our example below.

Summary

If you follow the “checklist”, your paper will conform to the requirements of the publisher and facilitate a problem-free publication process.

References

[1] J. van der Geer, J.A.J. Hanraads, R.A. Lupton, The art of writing a scientific article, J. Sci. Commun. 163 (2000) 51-59.

Reference to a book:

[2] W. Strunk Jr., E.B. White, The Elements of Style, third ed., Macmillan, New York, 1979.

Reference to a chapter in an edited book:

[3] G.R. Mettam, L.B. Adams, How to prepare an electronic version of your article, in: B.S. Jones, R.Z. Smith (Eds.), Introduction to the Electronic Age, E-Publishing Inc., New York, 1999, pp. 281-304.

[4] R.J. Ong, J.T. Dawley and P.G. Clem: submitted to Journal of Materials Research (2003)

[5] P.G. Clem, M. Rodriguez, J.A. Voigt and C.S. Ashley, U.S. Patent 6,231,666. (2001)

[6] Information on http://www.weld.labs.gov.cn

Structure and Magnetic Properties of Electron-doped Superconductor

Risdiana1, a\***,** Malik A. Baqiya2,b, Budhy Kurniawan3,c and T. Saragi1,d

1Department of Physics, Padjadjaran University, Jl. Raya Bandung-Sumedang km. 21 Jatinangor, Sumedang 45363, Indonesia

2Department of Physics, Faculty of Science and Data Analytics, Institut Teknologi Sepuluh Nopember (ITS), Kampus ITS, Sukolilo, Surabaya 60111, Indonesia

3Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Depok 16424, Indonesia

a\*risdiana@phys.unpad.ac.id (corresponding author), [bmalikabits@phys.its.ac.id](mailto:bmalikabits@phys.its.ac.id), cbudhy.kurniawana@sci.ui.ac.id, dt.saragi@phys.unpad.ac.id

**Keywords:** DC-magnetic susceptibility, electron-doped superconductor, Ni impurities, under-doped region.

**Abstract.** Electron-doped superconducting cuprates of Eu2-xCexCu1-yNiyO4+α-δin under-doped regionwith x = 0.12 and y = 0, 0.01 and 0.05 have been prepared, characterized and investigated in order to study the effect of Ni impurity to the magnetic properties of electron doped superconducting cuprates. all main peaks of tetragonal and T’ structure configuration of ECCO were observed in all samples. Temperature dependence of dc magnetic-susceptibility on field cooling at 5 Oe for Eu1.88Ce0.12Cu1-yNiyO4+α-δ with y = 0, 0.01, 0.005 and δ values from 0.0496 to 0.08322 shows diamagnetic behavior for sample with y = 0, starting from about 11 K. For sample with y = 0.01, Tc onset decreases to be around 4 K and superconductivity disappeared at y ≥ 0.05.

Introduction

Superconducting cuprates with single-layer of CuO2 plane called 214 cuprates have been one of great interests to be studied both in hole- and electron-doped systems [1-9]. For some reasons, research on electron doping superconductors is still very limited [10]. In general materials of electron-doped system, the excess oxygen in the samples is a problem that must be reduced by performing annealing process. Superconductivity at specific range of doping concentration can only occur when the material is annealed at a certain temperature and time, which causes the superconductivity in this system depend not only on the amount of doping concentration but also the amount of oxygen content [10-12].

Here, we report the study of effect of magnetic impurities of Ni to the physical properties of the structure and magnetic properties of the superconducting material of ECCO in under-doped region with x = 0.12.

Experiments

Electron-doped superconducting cuprates of Eu2-xCexCu1-yNiyO4+α-δ(ECCNO)in under-doped regionwith x = 0.12 and y = 0, 0.01 and 0.05 was prepared by a solid-state reaction method. The complete experimental procedures including samples preparation, pre-fired and sintering process are reported in previous reports [9,12]. To reduce the oxygen content in the as-grown sample, annealing process was carried out at 900°C for 11 hours in high purity of Ar gas flow [10,12].

All samples were characterized by x-ray diffraction (XRD) measurements to study crystal structure and Superconducting Quantum Interference Device (SQUID) to study magnetic susceptibility at Graduate School of Engineering, Tohoku University, Japan.

Result and Discussion

Figure 1 shows XRD spectra of ECCNO with x = 0.12 and y = 0, 0.01 and 0.05. All the main peaks can be observed and matched with the diffraction peaks of tetragonal with a planar shaped of CuO2 plane configuration, called T’ structure. Small one impurity peak at 33.05º was found in samples with y = 0.01 and 0.05 and identified to be the peak of CeO2.

|  |
| --- |
|  |
| **Figure 1.** Results of XRD characterization of ECCNO samples with x = 0.12 and y = 0, 0.01, and 0.05. |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Table 1.** Lattice parameter values ​​of ECCNO with x = 0.12 and y = 0, 0.01 and 0.05. | | | | | | Ce (x) | Ni (y) | a (Å) = b (Å) | c (Å) | V (Å3) | | 0.12 | 0 | 3.9071 | 11.8570 | 181.0075 | | 0.01 | 3.9068 | 11.8567 | 180.9752 | | 0.05 | 3.9079 | 11.8576 | 181.0936 | |

All lattice parameter values are calculated from dhkl values ​and Miller index as shown in Table 1. It is found that the lattice parameter value of a-axis ranges from 3.9068 Å to 3.9079 Å, while in the c-axis ranges from 11.885675 Å to 11.857766 Å. The volume of unit cells ranges from 180.9752 Å3 to 181.0936 Å3. It is known that the radius of the Ni2+ ion is larger than that of Cu2+ and the size of Cu2+ is in the horizontal conduction plane of CuO2.

The magnetic moment per unit volume can be expressed as shown in Eq. (1).

(1)

where *m* is magnetic moment per atom, *n* is the number of atoms per unit volume, is Boltzmann’s constant.

Summary

Electron-doped superconducting cuprates of Eu2-xCexCu1-yNiyO4+α-δ with x = 0.12 and y = 0, 0.01, and 0.05 have been successfully synthesized in order to study the effect of Ni impurity to the magnetic properties of electron-doped system in under-doped region. From XRD measurements, all main peaks of XRD data were observed in all samples indicating the electron-doped system of ECCO with tetragonal and T’ structure configuration was successfully prepared. From magnetic susceptibility data, superconducting phases with T*c* about 11 K and 4 K ware observed at samples with y =0 and 0.01, respectively. Superconductor phase disappeared in samples with y = 0.05 which is also followed by a weakening of the spin-spin correlation and a reduced a magnetization value.

**Acknowledgment**

These works were supported by Fundamental Research Funding (PDUPT) No. 2786/UN6.D/LT/2019 and Academic Leadership Grant of Padjadjaran University No. 3339/UN6.D/LT/2019

References

1. J. G. Bednorz and K. A. Muller, Phys. B 64, 189 (1986).
2. H. Takagi, T. Ido, S. Ishibashi, M. Uota, and S. Uchida, Phys. Rev. B, 40, 2254 (1989).
3. C. Panagopoulos, A. P. Petrovic, A. D. Hillier, J. T. Tallon, C. A. Scott, B.D. Rainford, Phys. Rev. B 69, 144510 (2004).
4. Y. Koike, T. Adachi, N. Oki, Risdiana, M. Yamazaki, T. Kawamata, T. Noji, K. Kudo, N. Kobayashi, I. Watanabe, K. Nagamine, Physica C 426-431, 189 (2005).
5. J. M. Tranquada, S. M. Heald, A. R. Moodenbaugh, F. Liang, M. Croft, Nature 337, 720 (1989).
6. Risdiana, T. Adachi, N. Oki, S. Yairi, Y. Tanabe, K. Omori, T. Suzuki, I. Watanabe, A. Koda, W. Higemoto and Y. Koike, Phys. Rev. B 77, 054516 (2008).
7. T. Adachi, N. Oki, Risdiana, S. Yairi, Y. Koike, I. Watanabe, Phys. Rev. B 78, 134515 (2008).
8. Y Maryati, A I Hanifah, M A B Subardhi, E A Rahayu, Y R Tayubi, M Manawan, T Saragi and Risdiana, Journal of Physics: Conf. Ser. 1080, 012022 (2018).
9. Yati Maryati, Nuráini Nafisah, Diba G. Auliya, Eka Nurwati,Tiara Amalia, Yuyu R. Tayubi, Togar Saragi and Risdiana, Materials Science Forum 966, 314-318 (2019).
10. M. Fujita, T. Kubo, S. Kuroshima, T. Uefuji, K. Kawashima, K. Yamada, I. Watanabe, K. Nagamine, Phys. Rev. B 67 (2003) 014514.
11. Risdiana, Pratiwi S, Suhendar D, Somantri W. W., Safriani L, Saragi T[AIP Conf. Proc.](https://www.scopus.com/sourceid/26916?origin=resultslist)1712, 050020 (2016).
12. Risdiana, T. Adachi, N. Oki, Y. Koike, T. Suzuki, I. Watanabe, Physical Review B 82, 014506 (2010).

=======================================================================

**Please Check again your Full Paper before submission:**

1. Type and font size of Title, Authors, Address, e-mail, Abstract, Introduction, and other parts in the paper
2. Figure including figure caption, Please follow the template of figure
3. Table including caption, Please follow the template of table
4. Equation, Please follow the template of equation
5. References, Please follow the template of references

=======================================================================