

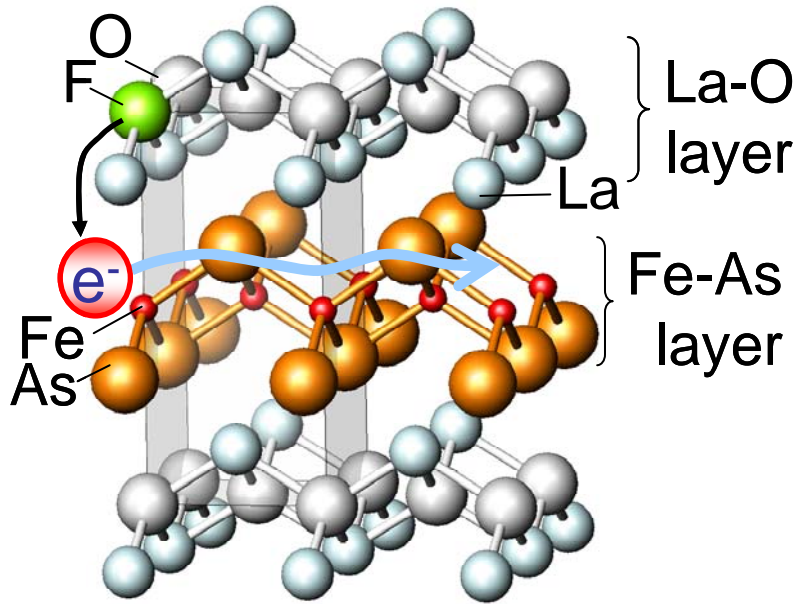
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(1) Highlight 2007

a. Discovery of Iron-based superconductors

We found a layered iron based oxypnictide LaOFeAs exhibits superconducting transition when F^- ions are doped to the O_{21} sites, evidenced by zero resistivity (ρ) and perfect diamagnetic susceptibility (χ). T_c depends largely on



the F^- ion content, exhibiting the highest temperature of ~ 26 K at $\sim 11\%$ F^- ion content. Observed T_c is the highest among transition-metal-based superconductors except Cu-based superconductors. We have also observed minimum resistivity in the normal conducting state in the ρ - T curves of the underdoped samples (F^- ion content less than 11%). The minimum temperature decreases with the F^- content and seems to merge with T_c in the overdoped samples. Such behavior is analogous to that observed in the

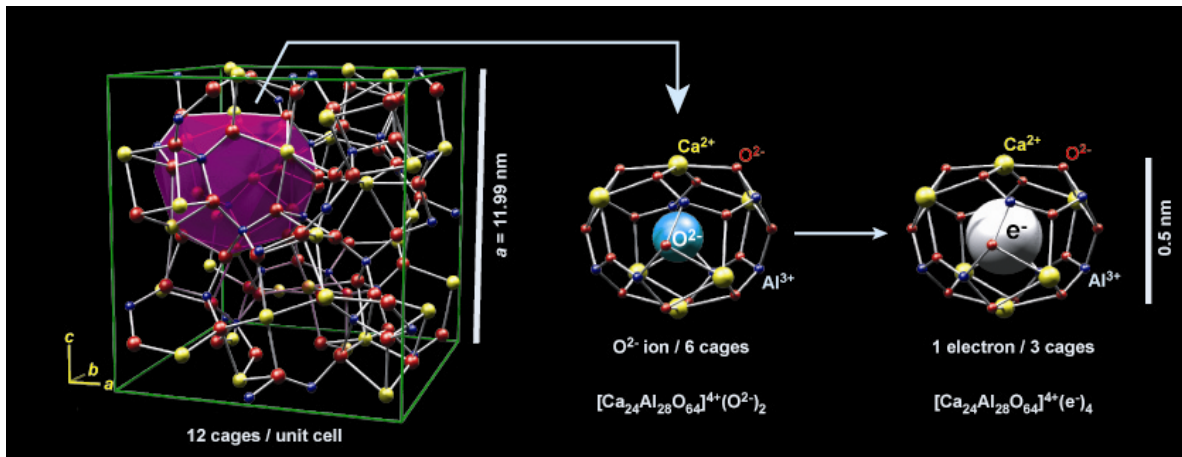
Cu-based oxide superconductors, suggesting the minimum is associated with “spin gap”. Moreover, a large magnetic susceptibility in the normal phase implies a possibility that the superconductivity is due to “spin triplet Cooper pair”. This possibility is circumstantially supported by the observation that the same structure compound LaOCoAs , in which $\text{Co}^{2+}(3d^7)$ has one more electron than $\text{Fe}^{2+}(3d^6)$, undergoes itinerant ferromagnetic transition at ~ 65 K. The F^- -doping to the oxygen-sites increases the electron density around Fe^{2+} in LaOFeAs , while Ca^{2+} ion doping, which should compensate carrier electrons (hole generation), decreases the electron density. The observation that the F^- -doping induces the superconductivity, but the Ca^{2+} -doping did not,

suggests a novel view that the superconducting phase in the electron-doped LaOFeAs is located close to the ferromagnetic phase, LaOCoAs.

b. Discovery of Metal-Insulator and Metal-Superconductor Transition Light metal oxides such as CaO, Al₂O₃ and SiO₂ are most abundant materials on the earth and are representative electrical insulators. Therefore, almost no electro-active function has been developed in spite of their inherent advantages such as environmental compatibility and low material cost.

In this report we show an inorganic electride 12CaO·7Al₂O₃:e⁻ (C12A7:e⁻) exhibits superconducting transition. Here, electride is an ionic crystal in which electrons serve as anions. C12A7:e⁻ is composed of representative insulators, CaO and Al₂O₃, and “anionic electrons” which are nominally replacing the crystallographic site of a specific oxygen anion. The transition was clearly observed at 0.2-0.4 K depending on the carrier concentration and the volume fraction of superconducting phase determined by ac magnetic susceptibility measurement is almost 100 % for the bulk single crystalline samples. This is the first superconductor realized in the family of light metal oxides as well as electrides.

C12A7:e⁻ was synthesized by electron doping $> 1.5 \times 10^{21} \text{cm}^{-3}$ to C12A7 crystal via removal these counter oxygen ions in the nano-cages keeping the original crystal structure as illustrated below.



The precursor of electride, C12A7, is a constituent of aluminous cement which is widely used. This material has a unique crystal structure composed of sub-nanometer-sized cages in which free oxygen ions are entrapped as counter anions. The resultant material composed of the representative insulators and “anionic electrons”, so that the unique crystal structure of electride is considered to be a new material platform to realize a new superconductor.

This finding would change an image for light metal oxides which are used as the major ingredients of traditional ceramics, stimulating the interest of material scientists for natural nanostructure embedded in abundant materials.

c. Elucidation of Electronic State in Transparent Amorphous Oxide Semiconductors

Ionic amorphous oxide semiconductors (IAOSs) are new materials for flexible thin film transistors that exhibit field-effect mobilities of $10 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$. K. Nomura *et al.*, *Nature* **488**, 432 (2004). The local coordination structure in an IAOS, In-Ga-Zn-O *a*-IGZO, was examined using extended x-ray absorption fine structure analysis combined with *ab initio* calculations. The short-range ordering and coordination structures in *a*-IGZO are similar to those in the corresponding crystalline phase, InGaZnO₄, and edge-sharing structures consisting of In-O polyhedra remain in the amorphous structure. The In³⁺ 5s orbitals form an extended state with a band effective mass of $0.2m_e$ at the conduction band bottom.

(2) Original Papers

Optoelectronic properties and electronic structure of YcuOSe;

Kazushige Ueda, Kouhei Takafuji, Hiroshi Yanagi, Toshio Kamiya, Hideo Hosono, Hidenori Hiramatsu, Masahiro Hirano and Noriaki Hamada:
J. Appl. Phys., **102**, 113714-1 - 113714-6, (2007)

Apparent bipolarity and Seebeck sign inversion in a layered semiconductor: LaZnOP;

K. Kayanuma, H. Hiramatsu, M. Hirano, R. Kawamura, H. Yanagi, T. Kamiya, and H. Hosono:
Phys. Rev. B, **76**, 195325, (2007)

Giant thermoelectric Seebeck coefficient of a two-dimensional electron gas in SrTiO₃;

HIROMICHI OHTA, SUNGWNG KIM, YORIKO MUNE, TERUYASU MIZOGUCHI, KENJI NOMURA, SHINGO OHTA, TAKASHI NOMURA, YUKI NAKANISHI, YUICHI IKUHARA, MASAHIRO HIRANO, HIDEO HOSONO AND KUNIHITO KOUMOTO:
Nature Mater., **6**, 129-134, (2007).

Work Function of a Room-Temperature, Stable Electride [Ca₂₄Al₂₈O₆₄]^{4+(e⁻)₄};

Yoshitake Toda, Hiroshi Yanagi, Eiji Ikenaga, Jung Jin Kim, Masaaki Kobata, Sigenori Ueda, Toshio Kamiya, Masahiro Hirano, Keisuke Kobayashi, and Hideo Hosono:

Adv. Mater., **19**, 3564-3569, (2007).

Circuits using uniform TFTs based on amorphous In–Ga–Zn–O;

Ryo Hayashi, Masato Ofuji, Nobuyuki Kaji, Kenji Takahashi, Katsumi Abe, Hisato Yabuta, Masafumi Sano, Hideya Kumomi, Kenji Nomura, Toshio Kamiya, Masahiro Hirano, Hideo Hosono:

Journal of the SID, **15/11**, 915-921, (2007)

Temperature Dependence of the Chemical Potential in Na_xCoO_2 : Implications for the Large Thermoelectric Power;

Yukiaki ISHIDA, Hiromichi OHTA, Atsushi FUJIMORI, and Hideo HOSONO:

Journal of the Physical Society of Japan, **76**[10], October, 103709(2007)

Vibrational Dynamics and Oxygen Diffusion in a Nanoporous Oxide Ion Conductor $12\text{CaO}\cdot 7\text{Al}_2\text{O}_3$ Studied by ^{18}O Labeling and incoherent Raman Spectroscopy;

Koichi Kajihara, Satoru Matsuishi, Katsuro Hayashi, Masahiro Hirano, and Hideo Hosono:

J. Phys. Chem. C **2007**, **111**, 14855-14861(2007)

Preparation of Semiconductive La-Doped BaSnO_3 by a Polymerized Complex Method and the Thermoelectric Properties; Masahiro Yasukawa, Kaoru Ikeuchi, Toshio Kono, Hiroshi Yanagi, and Hideo Hosono:

Journal of the Japan Society of Powder and Powder Metallurgy, **54**, 636-644(2007)

Room Temperature-Stable Electride as a Synthetic Organic Reagent: Application to Pinacol Coupling Reaction in Aqueous Media;

Haritha Buchammagari, Yoshitake Toda, Masahiro Hirano, Hideo Hosono, Daisuke Takeuchi, and Kohtaro Osakada:

Organic Letters, **9**, 4287-4289(2007)

Nickel-Based Oxyphosphide Superconductor with a Layered Crystal Structure, LaNiOP ;

Takumi Watanabe, Hiroshi Yanagi, Toshio Kamiya, Yoichi Kamihara, Hidenori Hiramatsu, Masahiro Hirano, and Hideo Hosono:

Inorg. Chem., **46**, 7719-7721, (2007)

Ultraviolet absorption of hydrogen related species in glassy silica:

L.Skuja, K. Kajihara, M. Hirano, H. Hosono:

Physics and Chemistry of Glasses, **48**, 103-106, (2007)

Novel room temperature stable electride $12\text{SrO} \cdot 7\text{Al}_2\text{O}_3$ thin films: fabrication, optical and electron transport properties:

M Miyakawa, N. Ueda, T. Kamiya, M. Hirano, and H. Hosono:

Journal of the Ceramic Society of Japan, **115**, 568 (2007)

Detection of Infrared Silent Proton in Hydrogen-Reduced Tungsten Phosphate Glasses by Thermal Desorption:

Hikomasa Tawarayama, Shouichi Sugata, Hiroyuki Inoue, Hideo Hosono, and Hiroshi Kawazoe:

Chem. Mater. **19**, 4385-4386(2007)

Diffusion of nitrogen molecules in amorphous SiO_2 :

Koichi Kajihara, Masahiro Hirano, Yasuyuki Takimoto, Linards Skuja, and Hideo Hosono:

Applied Physics Letters, **91**, 071904-6, (2007)

Heavy hole doping of epitaxial thin films of a widegap p-type semiconductor, LaCuOSe , and analysis of the effective mass:

Hidenori Hiramatsu, Kazushige Ueda, Hiromichi Ohta, Masahiro Hirano, Maiko Kikuchi, Hiroshi Yanagi, Toshio Kamiya, and Hideo Hosono:

Appl. Phys. Lett., **91**, 012104, (2007)

Fabrication of room temperature-stable $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$ electride: A review:

Sung-Wng Kim A Satoru Matsuishi, Masashi Miyakawa, Katsuro Hayashi, Masahiro Hirano, Hideo Hosono:

J Mater Sci: Mater Electron, **18**, S5-14, (2007).

Anion Incorporation-induced Cage Deformation in $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$ Crystal:

Takatoshi Nomura, Katsuro Hayashi, Yoshiki Kubota, Toshio Kamiya, Masahiro Hirano, Masaki Takata, and Hideo Hosono:

Chemistry Letters, **36**, 902-903 (2007)

Combinatorial approach to thin-film transistors using multicomponent semiconductor channels: An application to amorphous oxide semiconductors in In-Ga-Zn-O system;

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Appl. Phys. Lett., **90**, 242114, (2007)

Superconductivity in an Inorganic Electride $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3:e^-$;

M. Miyakawa, S.W. Kim, M. Hirano, Y. Kohama, H. Kawaji, T. Atake, H. Ikegami, K. Kono, H. Hosono:

J. Am. Chem. Soc.; (Communication), **129**, 7270-7271, (2007)

Photoelectron Spectroscopic Study of $\text{C12A7}:e^-$ and Alq_3 Interface: The Formation of a Low Electron-Injection Barrier;

Ki-Beom Kim, Maiko Kikuchi, Masashi Miyakawa, Hiroshi Yanagi, Toshio Kamiya, Masahiro Hirano, and Hideo Hosono:

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Epitaxial film growth, optical, electrical, and magnetic properties of layered oxide $\text{In}_3\text{FeTi}_2\text{O}_{10}$;

Youichi Ogo, Hiroshi Yanagi, Toshio Kamiya, Kenji Nomura, Masahiro Hirano, Hideo Hosono:

JOURNAL OF APPLIED PHYSICS, **101**, 103714, (2007)

Metallic State in a Lime-Alumina Compound with Nanoporous Structure;

Sung Wng Kim, Satoru Matsuishi, Takatoshi Nomura, Yoshiki Kubota, Masaki Takata, Katsuro Hayashi, Toshio Kamiya, Masahiro Hirano, and Hideo Hosono:

Nano Letters, **7**, 1138-1143, (2007).

Recent progress in transparent oxide semiconductors: Materials and device application;

Hideo Hosono:

Thin Solid Films, **615**, 6000-6014, (2007)

High electron doping to a wide band gap semiconductor $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$ thin film;

Masashi Miyakawa, Masahiro Hirano, Toshio Kamiya, and Hideo Hosono:

Applied Physics Letters, **90**, 182105, (2007)

Active anion manipulation for emergence of active functions in the nanoporous crystal $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$: a case study of abundant element strategy;

Hideo Hosono, Katsuro Hayashi, Masahiro Hirano:

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Fast Thin-Film Transistor Circuits Based on Amorphous Oxide Semiconductor;

Masato Ofuji, Katsumi Abe, Hisae Shimizu, Nobuyuki Kaji, Ryo Hayashi, Masafumi Sano, Hideya Kumomi, Kenji Nomura, Toshio Kamiya, and Hideo Hosono:

IEEE ELECTRON DEVICE LETTERS, **28**, 273-275, (2007)

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E. Fortunato, D. Ginley, H. Hosono, and D. Paine:

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Fluorine laser-induced silicon hydride SiH groups in silica;

Linarsds Skuja, Koichi Kajihara, Masahiro Hirano, and Hideo Hosono:

J. Non-Cryst. Solids, **353**, 526-529, (2007)

Reactivity of SiCl and SiF groups in SiO_2 glass with mobile interstitial O_2 and H_2O molecules;

Koichi Kajihara, Masahiro Hirano, Linards Skuja, Hideo Hosono:

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Nanoporous Crystal $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$: A Playground for Studies of Ultraviolet Optical Absorption of Negative Ions;

K. HAYASHI, P. V. SUSHKO, D. M. RAMO, A. L. SHLUGER, S. WATAUCHI, I. TANAKA, S. MATSUIISHI, M. HIRANO, and H. HOSONO:

J. Phys. Chem. B, **111**, 1946-1956, (2007)

From Insulator to Electride: A Theoretical Model of Nanoporous Oxide $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$;

Peter V. Sushko, Alexander L. Shluger, Masahiro Hirano, and Hideo Hosono:

J. Am. Chem. Soc., **129**, 942-951, (2007).

Giant thermoelectric Seebeck coefficient of a two-dimensional electron gas in SrTiO_3 ;

H. OHTA, S. KIM, Y. MUNE, T. MIZOGUCHI, K. NOMURA, S. OHTA, T. NOMURA, Y. NAKANISHI, Y. IKUHARA, M. HIRANO, HI. HOSONO, and K. KOUMOTO:

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Formation of Intrinsic Point Defects in Fluorine-doped Synthetic SiO₂ Glass by ⁶⁰Co gamma-ray Irradiation;

Koichi Kajihara, Masahiro Hirano, Linards Skuja, and Hideo Hosono:

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Local coordination structure and electronic structure of the large electron mobility amorphous oxide semiconductor In-Ga-Zn-O: Experiment and ab initio calculations;

Kenji Nomura, Toshio Kamiya, Hiromichi Ohta, Tomoya Uruga, Masahiro Hirano, and Hideo Hosono:

Phys. Rev. B, **75**, 035212, (2007)

Phosphorus co-doping effect on photoluminescence in Ce³⁺-doped SiO₂ glasses: The formation of unique ligand field by P-co-doping;

Akira Saitoh, Shuhei Murata, Satoru Matsuishi, Masanori Oto, Taisuke Miura, Masahiro Hirano, Hideo Hosono:

J. Luminescence, **122-123**, 355-358, (2007)

Development of latent images due to transient free carrier electrons by femtosecond laser pulses and its application to grating shape trimming;

Ken-ichi Kawamura, Takukazu Otsuka, Masahiro Hirano, Toshio Kamiya, and Hideo Hosono:

Appl. Phys. Lett., **90**, 011107, (2007).

Structural and photo-induced properties of Eu²⁺-doped Ca₂ZnSi₂O₇: A red phosphor for white light generation by blue ray excitation;

Hayato Kamioka, Takashi Yamaguchi, Masahiro Hirano, Toshio Kamiya, Hideo Hosono:

J. Luminescence, **122-123**, 339-341, (2007).

Electron emission characteristics of hydrogen doped 12CaO·7Al₂O₃ electride for PDP;

S. Webster, M. Ono, S. Ito, H. Kajiyama, T. Shinoda, and H. Hosono:

The 14th International Display Workshop (IDW'07), 795-798, (2007)

Electrode Materials for Low Electron / Hole Injection Barrier Formation in OLED;

H. Hosono, K. Kim, H. Yanagi, T. Kamiya, H. Hiramatsu and M. Hirano:

Proc. The 14th International Display Workshop (IDW'07) (Dec. 5-7, 2007, Sapporo Convention Center, Sapporo, Japan), OLED3-4, (2007)

Amorphous In-Ga-Zn-O based TFTs and Circuits;

K. Abe, H. Kumomi, K. Nomura, T. Kamiya, M. Hirano, and H. Hosono:

Proc. The 14th International Display Workshop (IDW'07) (Dec. 5-7, 2007, Sapporo Convention Center, Sapporo, Japan), (2007)

Transparent Amorphous Oxide Semiconductors for High Performance TFT;

Hideo Hosono:

Proceedings of SID'07, 1830-1833, (2007)

Diffusion and reactions of interstitial oxygen species in amorphous SiO₂;

Koichi Kajihara, Taisuke Miura, Hayato Kamioka, Akira Aiba, Motoko Uramoto, Yukihiro Morimoto, Masahiro Hirano, Linards Skuja, Hideo Hosono:

Journal of Non-Crystalline Solids, 354, 224-32, (2008).

Crystal Structures, Optoelectronic Properties, and Electronic Structures of Layered Oxychalcogenides M₂CuOCh (M = Bi, La; Ch = S, Se, Te): Effects of Electronic Configurations of M³⁺ Ions;

Hidenori Hiramatsu, Hiroshi Yanagi, Toshio Kamiya, Kazushige Ueda, Masahiro Hirano, and Hideo Hosono:

Chem. Mater., 20, 326, (2008).

Insulator-conductor transition in 12CaO7Al₂O₃ films: On the stability of the crystal lattice under Ar⁺ bombardment;

Peter V. Sushko, Alexander L. Shluger, Masahiro Hirano, and Hideo Hosono:

Thin Solid Films, 516, 1350, (2008)

Amorphous oxide channel TFTs;

Hideya Kumomi, Kenji Nomura, Toshio Kamiya, and Hideo Hosono:

Thin Solid Films, 516, 1516, (2008)

Evidence for Bardeen-Cooper-Schrieffer-type superconducting behavior in the electrified (CaO)₁₂(Al₂O₃)₇ · ε from heat capacity measurements;

Yoshimitsu Kohama, Sung Wng Kim, Takeo Tojo, Hitoshi Kawaji, Tooru Atake, Satoru

Matsuishi, and Hideo Hosono:

PHYSICAL REVIEW B **77**, 092505 (2008)

Iron-Based Layered Superconductor La[O_{1-x}F_x]FeAs (x= 0.05-0.12) with T_c = 26 K:

Yoichi Kamihara, Takumi Watanabe, Masahiro Hirano, and Hideo Hosono:

J. AM. CHEM. SOC., **130**, 3296-3297(2008)

(3) Invited/Plenary Talks in International Conference

Masahiro Hirano and Hideo Hosono: Cultivation of Electronic Functions in Transparent Oxides; *10th International Conference and Exhibition of the European Ceramic Society (Berlin, Germany, June 17-21, 2007)*, (2007).

Hideo Hosono: Introduction of Frontier Collaborative Research Center; *2007 Korea-Japan Workshop on Nanomaterials for IT (Dec. 27-28, 2007, Sungkyunkwan University)*, (2007).

K. Abe, H. Kumomi, K. Nomura, T. Kamiya, M. Hirano, and H. Hosono: Amorphous In-Ga-Zn-O based TFTs and Circuits; *The 14th International Display Workshop (IDW'07) (Dec. 5-7, 2007, Sapporo Convention Center, Sapporo, Japan)*, AMD9-2, (2007).

Hideo Hosono: Superconducting cement:ceramics renaissance through nanotechnology; *Symposium of Bio and Material COE Frontier (Yukohama, Nov.28)*, (2007).

Toshio Kamiya, Kenji Nomura and Hideo Hosono: The Present Status of Amorphous Oxide Semiconductors: Carrier Transport, Electronic Structure, and Device Applications; *International 21st Century COE Symposium on Atomistic Fabrication Technology (Osaka University, Oct. 15-17, 2007)*, (2007).

Hideo Hosono: Unique metallic state realized in refractory oxide 12CaO.7Al₂O₃ with nano-porous crystal structure; *2nd NIMS Japan-France Workshop on Nanotechnology (Strausburg, October 23, 2007)*, (2007).

Hideo Hosono: Transparent Amorphous Oxide Semiconductors; Materials Design Concept and Device Applications; *The 34th International Conference on Compound Semiconductors (October 17, 2007, Kyoto)*, (2007).

Kazuhisa Kurashige, Shunsuke Ueda, Yoshitake Toda, Satoru Matsuishi, Katsuro Hayashi, Masahiro Hirano, and Hideo Hosono: Growth of $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$ Single Crystal; *5th International Symposium on Transparent Oxide Thin Films for Electronics and Optics (TOEO-5, Shonan, Japan, May 21-22, 2007) 21aO02*, (2007).

Toshio Kamiya: Amorphous Oxide Semiconductor: Advantages, Applications, and The Present Status; *2007 Int. Conf. Solid State Devices and Materials (SSDM'07) Rump Session "Oxide Electronics -Status and Outlook-" (Epcoc Tsukuba, 9/19-21, 2007)*, (2007).

Hideo Hosono: Transparent Amorphous Oxide Semiconductors for High Performance Flexible TFTs ; *KAIST-EMDEC Seminar (Seoul, August 14, 2007)* , (2007).

Toshio Kamiya, Kenji Nomura, and Hideo Hosono: Oxide Semiconductors for Low-T TFTs: Fabrication, Transport properties, electronic structures and device characteristics; *2007 The Fourteenth International Workshop on Active-Matrix Flatpanel Displays and Devices -TFT Technologies and Related Materials- (July 11-13, 2007, Awaji Yumebutai International Conference Center, Hyogo, Japan)*, (2007).

Masahiro Hirano and Hideo Hosono: Cultivation of electronic function in transparent oxides; *10th international Conference and Exhibition of the European Ceramics Society*, (2007).

Masahiro Hirano and Hideo Hosono: New frontier in oxides and related compounds; *Materials 2007, (Porto, Portugal, August, 2007)* (2007). 基調講演

H.Hosono, T.Kamiya, and K.Nomura: Recent Advances in TAOS-TFT; *7th International Meeting on Information Display (Daegu, Korea, August 30, 2007)*, (2007).

Toshio Kamiya, Kenji Nomura and Hideo Hosono: Recent progress in amorphous oxide semiconductor: From structure, carrier transport to TFT performance; *Oxide TFT Workshop (ETRI, DaeJong, Korea, 2007/6/21)*, (2007).

Hidenori Hiramatsu, Kazushige Ueda, Hiromichi Ohta, Toshio Kamiya, Masahiro Hirano and Hideo Hosono: Transparent p-Type Semiconductors: Layered

Oxychalcogenides; *10th International Conference and Exhibition of the European Ceramic Society (Berlin, Germany, June 17-21, 2007)*, (2007).

Sung Wng Kim, Satoru Matsuishi, Katsuro Hayashi, Toshio Kamiya, Masahiro Hirano, and Hideo Hosono: Metal-Insulator Transition in a Lime-Alumina Compound with Nanoporous Structure; *Joint Conf. 1st Int. Conf. on the Sci. and Technol. for Adv. Ceramics (STAC) and 2nd Int. Conf. on Joining Technology for New Metallic Glasses and Inorg. Mater. (JTMC) (STAC-JTMC, Shonan, Japan 23-25, May, 2007)*, 24Ap004, (2007).

Hidenori Hiramatsu, Hiroshi Yanagi, Toshio Kamiya, Masahiro Hirano, Noriaki Matsunami and Hideo Hosono: Carrier transport properties of copper-containing chalcogenide thin films deposited at room temperature; *5th International Symposium on Transparent Oxide Thin Films for Electronics and Optics (TOEO-5, Shonan, Japan, May 21-22, 2007)* 21p003, (2007).

H. Kumomi, K. Nomura, T. Kamiya, H. Hirano, and H. Hosono: Uniformity and integrated circuits of amorphous oxide channel TFTs; *European Mater. Res. Soc. Symp. Spring Meeting (E-MRS2007, Strasbourg, France, May 28 - June 1, 2007)* I-6-6, (2007).

H. Hosono: Function Cultivation in Transparent Oxide Utilizing built-in nanostructure; *ICYS-ICMR Summer School (July 23, Tsukuba)*, (2007).

H. Hosono: RT-stable electrides for display applications; *International Display Manufacturing Conference & Exhibition (Taipei, July 3-6, 2007)*, (2007).

H. Hosono: New Type Oxide Semiconductors; *14th International Symposium on Intercalation Compounds (June, 12-15, Seoul, Korea) (Plenary Talk)*, (2007) 基調講演

H.Hosono,K.Nomura and T.Kamiya: Transparent Amorphous Oxide Semiconductors for High Performance TFT's; *SID 2007 International Symposium (Ling Beech, CA, USA. May, 21-25, 2007)*, (2007).

Hideo Hosono, Toshio Kamiya, Hiroshi Yanagi: Room temperature stable electride and its application to the cathod in OLED; *Asia Display 2007 International Conference*

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Hideo Hosono: Electron in Glass: transparent amorphous oxide semiconductors and room temperature stable electride glass-ceramics; *International Workshop on Scientific Challenges for New Functionality in Glass (Washington DC, April 15-17, 2007)*, (2007).

Hideo Hosono: Room temperature stable electride : synthesis, properties, electronic structure, and application; *The 5th International Symposium on exploring new science by bridging particle-matter hierarchy (Sendai, Feb. 14-15, 2007)*, (2007).

Hideo Hosono: Frontier of Recent Progress in Transparent Oxide Semiconductors: New Materials and Device Application; *The 31st International Cocoa Beach Conference & Exposition on Advanced Ceramics and Composites (Florida, Jan.20-26, 2007)*, (2007).

(4) Award

Yukiaki Ishida, Hiromichi Ohta, Atsushi Fujimori and Hideo Hosono: Temperature dependence of the chemical potential in Na_xCoO_2 : Implications for the large thermoelectric power; *JPSJ Papers of Editor's Choice*, (2007).