

Publications, Invited talks, Patents

M. Yudasaka

(* : Corresponding author or similar due)

English Journals

1. "Biodegradation of carbon nanohorns in macrophage cells." M Zhang*, M Yang, C Bussy, S Iijima, K Kostarelos, M Yudasaka+. *Nanoscale*. 2015 Jan 19. PMID: 25597450
2. "Multifunctional carbon nanohorn complexes for cancer treatment." SA Chechetka, B Pichon, M Zhang, M Yudasaka, S Bégin-Colin, A Bianco, E Miyako*. *Chem. Asian J.* 10,160-165 (2015).
3. "Carbon nanohorns as a scaffold for the construction of disposable electrochemical immunosensing platforms. Application to the determination of fibrinogen in human plasma and urine." I Ojeda, B Garcinuño, M Moreno-Guzmán, A González-Cortés, M Yudasaka, S Iijima, F Langa, P Yáñez-Sedeño, JM Pingarrón. *Anal Chem.* 86, 7749-56 (2014).
4. "Photothermal conversion of carbon nanohorns enhancing caprolactone polymerization." M. Yang*, M. Zhang, M. Kunioka, R. Yuge, T. Ichihashi, S. Iijima, M. Yudasaka*. *Carbon* 83, 15-20 (2014).
5. "Photofunctional nanomodulators for bioexcitation", E. Miyako*, J. Russier, M. Mauro, C. Cebrian, H. Yawo, C. Ménard-Moyon, J.A. Hutchison, M. Yudasaka, S. Iijima, L. De Cola, A.Bianco. *Angew. Chem. Int. Ed. Engl.* 53, 13121-5(2014).
6. "Lysosomal membrane permeabilization: carbon nanohorn-induced reactive oxygen species generation and toxicity by this neglected mechanism." M Yang*, M Zhang, Y Tahara, S Chechetka, E Miyako, S Iijima, M Yudasaka*. *Toxicol Appl Pharmacol.* 280(1), 117-26 (2014).
7. "Ultrastructural localization of intravenously injected carbon nanohorns in tumor", S. Matsuura, R. Yuge, S. Sato, A. Tomida, T. Ichihashi, H. Irie, S. Iijima, K. Shiba*, M. Yudasaka*. *International Journal of Nanomedicine*, 9, 3499-3508 (2014).
8. "Effect of functional group polarity on the encapsulation of C60 derivatives in the inner space of carbon nanohorns" K. Kobayashi, H. Ueno, K. Kokubo, M. Yudasaka and H. Yasuda, *Carbon*, 68, 346–351(2014).
9. "Photoinduced electron transfer in a carbon nanohorn–C60 conjugate" M. Vizuete, M. J. Gomez-Escalonilla, J. L. G. Fierro, K. Ohkubo, S. Fukuzumi*, M. Yudasaka, S. Iijima, J.F. Nierengarteng, F. Langa*. *Chem. Sci.* 5, 2072-2080 (2014).
10. "Evidence of selective oxidation in surface layers of graphite-like thin sheets by mild oxidation" M. Nakamura*, T. kawai, R. Yuge, S. Bandow, S. Iijima, M. Yudasaka*, *Carbon*, 71, 70-75(2014).
11. "Gastrointestinal actions of orally-administered single-walled carbon nanohorns" M. Nakamura, Y. Tahara, T. Murakami, S. Iijima, M. Yudasaka, *Carbon*, 69, 409-416(2014).
12. "Size-dependent biodistribution of carbon nanohorns in vivo" M. Zhang*, T. Yamaguchi, S. Iijima and M. Yudasaka*, *Nanomedicine*, 9(5), 657-64(2013).
13. "Thermal-treatment-induced enhancement in effective surface area of single-walled carbon nanohorns for supercapacitor application" H. J. Jung, Y. -J. Kim, J. H. Han, M. Yudasaka, S. Iijima, H. Kanoh, Y. A. Kim, K. Kaneko and C. -M. Yang, *J. Phys. Chem. C*, 117(49), 25877-25883(2013).
14. "Carboxylation of thin graphitic sheets is faster than that of carbon nanohorns" M. Nakamura*, M. Irie, R. Yuge, T. Ichihashi, S. Iijima and M. Yudasaka*, *Phys. Chem. Chem. Phys.*, 15, 16672-16675 (2013).

15. “Self-Assembled Carbon Nanotube Honeycomb Networks Using a Butterfly Wing Template as a Multifunctional Nanobiohybrid” E. Miyako*, T. Sugino, T. Okazaki, A. Bianco, M. Yudasaka, and S. Iijima, *ACS Nano*, 7(10), 8736-8742 (2013).
16. “Benzyne cycloaddition onto carbon nanohorns.” D. Chronopoulos, N. Karousis N, T. Ichihashi, M. Yudasaka, S. Iijima, N. Tagmatarchis*. *Nanoscale*. 5(14), 6388-9634 (2013).
17. “Graphite-like thin sheets with even-numbered layers” M. Nakamura*, T. Kawai, M. Irie, R. Yuge, S. Iijima, S. Bandow and M. Yudasaka*, *Carbon*, 61, 644–647(2013)
18. “Immunoassay with Single-Walled Carbon Nanotubes as Near-Infrared Fluorescent Labels” Y. Iizumi, T. Okazaki*, Y. Ikehara, M. Ogura, S. Fukata and M. Yudasaka*, *ACS Appl. Mater. Interfaces*, 5(16), 7665–7670 (2013).
19. “Structural modeling of dahlia-type single-walled carbon nanohorn aggregates by molecular dynamics” L. Hawelek, A. Brodka, J. C. Dore, A. C. Hannon, S. Iijima, M. Yudasaka, T. Ohba, K. Kaneko and A. Burian, *J. Phys. Chem. A*, 117(37), 9057-61(2013)
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21. “Quantification of whole body and excreted carbon nanohorns intravenously injected into mice”M. Zhang*, Y. Tahara, M. Yang, X. Zhou, S. Iijima and M. Yudasaka*, *Adv. Healthc. Mater.*, 3(2), 239-44(2013).
22. “Neon and CO₂ adsorption on open carbon nanohorns”, V. Krungleviciute, C.A. Ziegler, S. R. Banjara, M. Yudasaka, S. Iijima and A. D. Migone, *Langmuir*, 29(30), 9388-97(2013).
23. “Mechanism of cell interactions with water-dispersed carbon nanohorns” T. Murakami, M. Nakatani, M. Kokubo, H. Nakatsuji, M. Inada, H. Imahori, M. Yudasaka, S. Iijima and K. Tsuchida. *Nanosci. Nanotechnol. Lett.*, 5, 402-407(2013).
24. “A high PEG density on graphene nanomaterials reduces the detachment of lipid-PEG and macrophate” M. Yang, M. Wada, M. Zhang, K. Koatarellos, R. Yuge, S. iijima, M. Masuda*, M. Yudasaka*. *Acta Biomateriala* 9, 4744-4753 (2013).
25. “Cooperative adsorption of supercritical CH₄ in single-walled carbon nanohorns for compensation of nanopore potential.” T. Ohba*, K. Kaneko, M. Yudasaka, S. Iijima, A. Takase, H. Kanoh. *J. Phys. Chem. C*. 116, 21870-21873 (2012).
26. “Small-sized carbon nanohorns enabling cellular uptake control” M. Zhang*, X. Zhou, S. Iijima, M. Yudasaka*. *Small* DOI:10.1002/sml.201102595 (2012).
27. “Photothermic regulation of gene expression triggered by laser-induced carbon nanohorns” E. Miyako*, T. Deguchi, Y. Nakajima, M. Yudasaka, Y. Hagihara, M. Horie, M. Shichiri, Y. Higuchi, F. Yamashita, M. Hashida, Y. Shigeri, Y. Yoshida, S. Iijima*. *Proc. Natl. Acad. Sci.* 109, 7523-7528 (2012).
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30. "Lysosomal membrane destabilization induced by high accumulation of single-walled carbon nanohorns in murine macrophage RAW 264.7" Y. Tahara, M. Nakamura, M. Yang, M. Zhang, S. Iijima, M. Yudasaka*. *Biomaterials* 33, 2762-2769 (2012).
31. "CO₂ adsorption on dahlia-like carbon nanohorns: Isosteric heat and surface area measurements", V. Krungleviciute*, A.D. Migone, M. Yudasaka, S. Iijima. *J. Phys. Chem. C* 116, 306-310 (2012).
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37. "A soluble hybrid material combining carbon nanohorns and C₆₀", M. Vizuete, M. J. Gomez-Escalonilla, J. L. G. Fierro, M. Yudasaka, S. Iijima, M. Vartanian, J. Iedl, J.-F. Nierengarten, F. Langa*. *Chem. Comm.* 10.1039/c1cc15446j (2011).
38. "High-power super capacitor electrodes from single-walled carbon nanohorn/nanotube composite", A. Izadi-Najafabadi, R. Yamada, D. N. Futaba, M. Yudasaka, H. Takagi, H. Hatori, S. Iijima, K. Hata. *ACS Nano* 5, 811-819 (2011).
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44. "Polymer Covalent Functionalization of Carbon Nanohorns Using Bulk Free Radical Polymerization" G. Mountrichas, S. Pipas, T. Ichihashi, M. Yudasaka, S. Iijima, N. Tagmatarchis*, *Chem. A European J.* 16, 5927-5933 (2010).

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50. "Solvent-free microwave-assisted Bingel reaction in carbon nanohorns" S. P. Economopoulos, G. Pagona, M. Yudasaka, S. Iijima and N. Tagmatarchis*. *J. Mater. Chem.* 19, 7326-7331 (2009).
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5. "カーボンナノチューブでつくるメディカル・デバイス" 松村幸子、湯田坂雅子、飯島澄男、芝清隆* (『バイオナノプロセス』シーエムシー出版 2008) 第29章 p.286-300.
6. "カーボンナノホーンとカーボンナノチューブ" 湯田坂雅子*、飯島澄男。(『絵で見てわかるナノDDS』編集・田端泰彦(株)メディカルドゥ、2007) 第2章2項 p.170-175.
7. "カーボンナノホーンの開発と応用" 湯田坂雅子*、飯島澄男 (『ナノカーボンハンドブック』編集・遠藤守信、飯島澄男、エヌ・ティー・エス 2007) 16節 p.126-131.
8. "単層カーボンナノチューブの生成機構と制御", 湯田坂雅子 (『カーボンナノチューブの基礎と応用』[共編] 斎藤理一郎・篠原久典 培風館 2004.) 第15章 p.205-218.
9. "単層カーボンナノチューブとナノホーンの生成機構と生成法" 湯田坂雅子 (『カーボンナノチューブの基礎と工業化の最前線』エヌ・ティー・エス 2002) 第10講 p.283-292.
10. "Single-wall carbon nanotubes and single-wall carbon nanohorns" M. Yudasaka. ("Perspective of Fullerene Nanotechnology" Proceedings: International fullerenes Workshop 2001. Ed. E. Osawa, Kluwer Academic Publishers, Dordrecht/Boston/London, 2002.) p. 125-130 in Chap. III.
11. "カーボンナノチューブの生成機構", 湯田坂雅子 (『カーボンナノチューブ—期待される材料開発—』シーエムシー出版 2001) 第4章、 p.22-26.
12. "カーボンナノチューブの生成機構", 湯田坂雅子 (化学フロンティア②『カーボンナノチューブ—ナノデバイスへの挑戦—』編集・田中一義、化学同人 2001) 第4章、 p.79-88.
13. "Mechanism of Metal Catalysts Controlling Formation of Single-Wall Carbon Nanotubes" M. Yudasaka*, Y. Kasuya, M. Takizawa, S. Bandow, K. Takahashi, F. Kokai, S. Iijima. ("Electronic properties of novel materials-Molecular nanostructures" XIV International Winterschool/Euroconference Kirchberg, Tirol, Austria 2000, AIP Conference Proceedings 544, Melville, New York, 2000) p.217-221
14. "Graphitization of carbonaceous materials by Ni, Co and Fe", M. Yudasaka* and R. Kikuchi, *Supercarbon* (Eds. S. Yoshimura, R.P.H. Chang) Springer-Verlag Berlin Heidelberg, 33, 99 (1998).
15. "Intercalation into multiwall carbon nanotubes: the reaction that distinguishes Russian doll and scroll structural types", V.Z. Mordkovich, M. Baxendale, M. Yudasaka, R. Kikuchi, S. Yoshimura, J.-Y. Dai, R.P.H. Chang, *Supercarbon* (Eds. S. Yoshimura, R.P.H. Chang) Springer-Verlag Berlin Heidelberg, 33, 107 (1998).
16. "Pulsed laser deposition of polyperinaphthalene", M. Yudasaka*, *Hand Book of Thin Film Process Technology*, (Edt. D.A. Glocker, S.I. Shah), Institute of Physics Publishing Ltd., Bristol and Philadelphia, X7.2, (1995).

その他省略

Invited Talks (International)

1. “7th International Symposium on Nanomedicine” November, 7, 2013. “Toxicity Mechanism of Nanocarbon”, M. Yudasaka
2. “ATI 2013 Nano-Carbon meeting at Zao” July, 28, 2013. “Interaction of nanocarbons with living tissue”, M. Yudasaka
3. “Carbon Based nanoporous Materials”, May 26, 2012. “High Uptake Toxicity of Single-Walled Carbon Nanohorns in Murine macrophage RAW264.7”, M. Yudasaka
4. “International Symposium on Nanomedicine (ISNM2012)” Matsue, Japan, November 29-December 1, 2012. “Interaction of carbon nanohorns with biological systems”. M. Yudasaka
5. “2012 A3 Symposium on Emerging Materials: nanomaterials for Energy and Environments” –ATI International Forum-” Sendai, Japan, October 29-November 1, 2012. “Interaction of carbon nanohorns with biological systems” M. Yudasaka
6. “The Second Symposium on Carbon Nanoforms”, Tsukuba, Japan, July 9-10, 2012. “High Uptake Toxicity of single-walled carbon nanohorns in murine macrophage RAW264.7” M. Yudasaka.
7. “The 3rd Symposium on Future Challenge for Carbon –Based Nanoporous Materials” Shinshu University, Nagano, Japan, May 26-29, 2012. “High Uptake Toxicity of single-walled carbon nanohorns in murine macrophage RAW264.7” M. Yudasaka.
8. “The First Symposium on Carbon Nanoforms”, Toledo, Spain, June 2-3, 2011. “Drug Delivery Application of Carbon Nanohorns” M. Yudasaka.
9. “International Conference on Science and Technology of Synthetic Metals 2010” Kyoto, Japan, July 4-9, 2010. “Drug Delivery Application of Carbon Nanohorns” M. Yudasaka.
10. “The 6th Japan Korea Symposium on Carbon Nanotubes” Okinawa, Japan, October 26-28, 2009. “Drug delivery application of carbon nanohorns” M. Yudasaka.
11. “3rd international Symposium on Nanomedicine-Molecular imaging for System Biology”, Okazaki Conference Center, Okazaki, Japan, Nov. 3-4, 2009. “DDS Application of Carbon Nanohorns” M. Yudasaka
12. “International Symposium of NanoMedicines and Asian Core Symposium” Okazaki Conference Center, Feb. 6-7. 2009. “Application of carbon nanohorns to anti-cancer drug carriers” M. Yudasaka
13. “1st Carbon nanotube biology, medicine, and Toxicology” Satellite Symposium of NT08. Le Corum, Montpellier, France, June 28, 2008. “Application of nanohorns to anti-cancer drug carriers” M. Yudasaka
14. “Ninth International Conference on the Science and Application of nanotubes.” Le Corum, Montpellier, France, June 29-July 4, 2008. “Application of carbon nanohorns to drug delivery systems” M. Yudasaka
15. “International Carbon Nanotube Conference in NU” Noyori Memorial Conference Hall, Nagoya university, Japan, February 14-15, 2008. “Application of Carbon Nanohorns to Drug Delivery Systems” M. Yudasaka
16. “The 4th Japan Korea Symposium on Carbon Nanotubes” 関西セミナーハウス、京都府 August 28-31, 2007. “DDS application of single-wall carbon nanohorns” M. Yudasaka*, J. Miyawaki, T. Murakami, J.

Xu, K. Ajima, M. Zhang, F. fang, K. Tsuchida, S. Iijima.

17. “14th Annual International Conference on Composites / Nano Engineering” Broomfield, Colorado, USA, July 2-8, 2006 (Organizer : Prof. D. Hui, Univ. Of New Orleans, USA)
“Application of single-wall carbon nanohorns” M. Yudasaka
18. “Carbon Nanotubes Workshop & Conference” The Royal Crown Hotel, Brussels, Belgium, April 24-26, 2006. Organizer: Pira International
19. “The 3rd Japan Korea Symposium on Carbon Nanotubes” Gyeongju, Korea, October 14-17, 2006.
“Application of carbon nanohorns.” M. Yudasaka
20. “The 2nd Korea-Japan symposium on Carbon Nanotubes” 大観荘、仙台松島、宮城県, Nov. 27-30, 2005.
21. “The 2nd Invited Workshop on Single-wall Carbon Nanotube Growth Mechanisms” Guadalupe River Ranch, Texas , USA. April 8-12, 2005. (Organizer: NASA Johnson Space Center and Rice University’s Center for Nanoscale Science and Technology).
“Metal free growth of nanohorns” M. Yudasaka
22. “11th Asian Chemical Congress (11th ACC)” Korea University, Seoul, Korea, Aug 24-26, 2005.
Organizer: The Federation of the Asian Chemical Societies (FACS)
23. “7th Biennial International Workshop in Russia: Fullerenes and Atomic Clusters” (IWFAC’2005) St. Petersburg, Russia June 27-July 1, 2005
24. Spring ACS meeting “Symposium on Purification, Separation and Characterization of Single-Walled Carbon Nanotubes” Anaheim, California, USA, March 28-April 1, 2004.
“Light-assisted oxidation for diameter-selective removal of SWNTs” M. Yudasaka, M. Zhang, S. Iijima, S. Maruyama.
25. “1st Japan-Korea Symposium on Carbon Nanotubes” Seogwipo KAL Hotel, Korea October 13-16, 2004
“Utilizing nanospaces of single-wall carbon nanohorns” M. Yudasaka
26. (UK) 第3回アジア・太平洋地域先端科学セミナー/Advanced Science Institute (ASI会議) July 25-31, 2004, 宮城蔵王、主催 独立行政法人 日本学術振興会 国際事業
27. “International Symposium on Micro-Mechanical Engineering (ISMME2003)”. 日立製作所 (土浦、茨城県) December 1-3, 2003
28. “The 1st Invited Workshop on Single-wall Carbon Nanotube Growth Mechanisms” Guadalupe River Ranch, Texas , USA, March 28-April 2, 2000. Organizer: NASA Johnson Space Center and Rice University’s Center for Nanoscale Science and Technology.
29. “Purity and Dispersion Measurement Issues Workshop on Single-Wall Carbon Nanotubes”, Green Auditorium, NIST, Gaithersburg, MD (USA). 27-29 May, 2003
30. “Diamond 2003 - The 14th European Conference on Diamond, Diamond-Like Materials, Carbon Nanotubes, Nitrides and Silicon Carbide” Sazburg, Austria, September 7-12, 2003
“Growth Mechanism of Carbon Nanotubes” M. Yudasaka
31. “Tsukuba Symposium on Carbon Nanotube in Commemoration of the 10th Anniversary of Its Discovery”, つくば国際会議場、October 3-5, 2001.

その他 省略

招待講演 (国内)

1. NEC ナノカーボンセミナー、NEC 本社多目的ホール、東京、2013年12月13日

- 「カーボンナノホーンの医療応用と安全性」湯田坂雅子
2. 日本薬学会代32年会、北海道大学、札幌、2012年3月28-31日
「国研の取組：ナノカーボンのドラッグデリバリー応用可能性」
 3. 日本光医学・光生物学会 東京慈恵医科大学、東京、2010年7月30-31日
「カーボンナノチューブの光医療応用について」湯田坂雅子
 4. 仙台プラズマフォーラム平成21年度東北大学電気通信研究所共同プロジェクト研究会、プラズマナノバイオエレクトロニクス基礎研究、東北大学、仙台、2010年2月23-24日
「ナノホーンのDDS応用可能性」湯田坂雅子
 5. 材料微細組織と機能性 第133委員会 第203回研究会 東京理科大学 理窓開会 第一会議室、東京、2009年10月23日
「カーボンナノチューブの展望」湯田坂雅子
 6. 新世代研究所 2009年第一回ナノカーボン研究会および蔵王09研究会—ナノチューブ、グラフェン、ナノカーボンに関する研究会— 高宮瑠璃倶楽部リゾート、蔵王、山形、2009年8月2-3日
「Application of carbon nanohorns to drug delivery system」湯田坂雅子
 7. 第25回日本DDS学会 東京ドームホテル 2009年7月3-4日
「カーボンナノホーンのDDS応用」湯田坂雅子
 8. ニューセラミックス懇話会、名古屋、2009年7月31日
「カーボンナノチューブやナノホーンのバイオ応用」湯田坂雅子
 9. 第36回フラーレンナノチューブシンポジウム、名城大学、2009年3月2-4日
「カーボンナノホーンを用いたドラッグデリバリー」湯田坂雅子
 10. 未踏・ナノデバイステクノロジー第151委員会 第83回研究会、日本学術振興会、KKR 逗子末汀園 2008年2月1-2日
「カーボンナノホーンとカーボンナノチューブのDDS応用」湯田坂雅子

その他省略

工業所有権

① [国外特許]

| | 登録番号 (登録日) | 発明者 | 発明の名称 | 出願人 | 出願国 |
|----|------------------------------|---|---|---|--------|
| 1 | ZL02804297. 2 (2006/7/26) | 飯島澄男 湯田坂雅子 小海文夫 高橋邦光 糟屋大介 金子克己 村田克之 | カーボンナノホーン 吸着材とその製造方 法 | (独) 科学技 術振興機構、 日本電気株 式会社 | 中国 |
| 2 | 820652 (2008/4/2) | 飯島澄男 村田克之 金子克美 湯田坂雅子 | カーボンナノホーン 吸着材とその製造方 法 | (独) 科学技 術振興機構、 日本電気株 式会社 | 韓国 |
| 3 | 881317 (2009/1/23) | 飯島澄男 湯田坂雅子 小塩明 | カーボンナノチュー ブ・カーボンナノホ ーン複合体とその製 造方法 | (独) 科学技 術振興機構、 日本電気株 式会社 | 韓国 |
| 4 | 7. 067. 096 (2006/6/27) | 飯島澄男 湯田坂雅子 小塩明 | CARBON NANOTUBE- CARBON NANOHORN COMPLEX AND METHOD FOR PRODUCING THE SAME | (独) 科学技 術振興機構、 日本電気株 式会社 | 米国 |
| 5 | 1464618 (2011/9/14) | 飯島澄男 湯田坂雅子 小塩明 | ACUTE TIP. MULTI- WALL CARBON NANOTUBE RADIAL AGGREGATE AND METHOD OF PRODUCING THE SAME | (独) 科学技 術振興機構、 日本電気株 式会社、 (財) 産業創 造研究所 | EPC 出願 |
| 6 | 935867 (2009/12/30) | 飯島澄男 湯田坂雅子 小塩明 | 鋭端多層カーボンナ ノチューブ放射状集 合体とその製造方法 | (独) 科学技 術振興機構、 日本電気株 式会社 | 韓国 |
| 7 | I233425 (2005/6/1) | 飯島澄男 湯田坂雅子 小塩明 | 鋭端多層カーボンナ ノチューブ放射状集 合体とその製造方法 | (独) 科学技 術振興機構、 日本電気株 式会社 | 台湾 |
| 8 | 7. 261. 941 (2007/8/28) | 飯島澄男 湯田坂雅子 小塩明 | ACUTE TIP. MULTI- WALL CARBON NANOTUBE RADIAL AGGREGATE AND METHOD OF PRODUCING THE SAME | (独) 科学技 術振興機構、 日本電気株 式会社 | 米国 |
| 9 | 6967043 (2005/11/22) | 飯島澄男 湯田坂雅子 小塩明 | METHOD OF MANUFACTURING THE DENSEST MULTI-WALL CARBON NANOTUBE | (独) 科学技 術振興機構、 日本電気株 式会社 | 米国 |
| 10 | ZL03805486. 8 (2008/1/9) | 飯島澄男 湯田坂雅子 | ナノホーン担持体と その製造方法 | (独) 科学技 術振興機構、 日本電気株 式会社 | 中国 |
| 11 | 7. 323. 246 (2008/1/29) | 飯島澄男 湯田坂雅子 | NANO HORN CARRIER AND METHOD OF MANUFACTURING THE SAME | (独) 科学技 術振興機構、 日本電気株 式会社 | 米国 |
| 12 | 7. 803. 346 (2010/9/28) | 飯島澄男 湯田坂雅子 | STRUCUTRES SELECTING METHOD | (独) 科学技 術振興機構、 | 米国 |

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|----|----------------------------------|-------------------------------|---|--------------------------|----|
| | | 張民芳 | FOR CARBON NANOTUBES BY LIGHT IRRADIATION | 日本電気株式会社 | |
| 13 | ZL200480016853.9 (2008/11/26) | 飯島澄男 村田克之 金子克己 湯田坂雅子 | 単層カーボンナノホーン吸着材およびその製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 中国 |
| 14 | 8.007.908 (2011/8/30) | 飯島澄男 村田克之 金子克己 湯田坂雅子 | SINGLE WALLED CARBON NANOHORN ADSORPTIVE MATERIAL AND METHOD FOR PRODUCING THE SAME | (独)科学技術振興機構、 日本電気株式会社 | 米国 |
| | 8.835.006 (2014/9/16) | 飯島澄男 湯田坂雅子 宮脇仁 | カーボンナノホーン担持体とカーボンナノチューブの合成方法 | (独)科学技術振興機構、 日本電気株式会社 | 米国 |

② [国内特許]

| | 出願番号 | 発明者 | 発明の名称 | 出願人 | 出願国 |
|---|-------------------------|---|--|--|-----|
| 1 | 5106123 (2012/10/12) | 飯島澄男 湯田坂雅子 宮脇 仁 | カーボンナノホーン担持体とカーボンナノチューブの合成方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 2 | 3623732 (2004/12/3) | 飯島澄男 湯田坂雅子 張民芳 | 単層カーボンナノチューブの製造方法とそれにより得られる単層カーボンナノチューブおよび多孔質体原料 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 3 | 3660236 (2005/3/25) | 飯島澄男 湯田坂雅子 小海文夫 高橋邦充 ジェイムズ アデレーネ ニーシャ | 酸化触媒および触媒担体 | (独)科学技術振興機構、 日本電気株式会社、財団 法人産業創造研究所 | 日本 |
| 4 | 3453377 (2003/7/18) | 飯島澄男 安嶋久美子 湯田坂雅子 | カーボンナノチューブ・カーボンナノホーン複合体とその製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 5 | 3453379 (2003/7/18) | 飯島澄男 湯田坂雅子 小塩明 | 密に詰まった多層カーボンナノチューブの製造方法 | (独)産業技術総合研究所、 日本電気株式会社 | 日本 |
| 6 | 3453378 (2003/7/18) | 飯島澄男 湯田坂雅子 小塩明 | 鋭端多層カーボンナノチューブ放射状集合体とその製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 7 | 3598291 (2004/09/17) | 飯島澄男 湯田坂雅子 小海文夫 高橋邦充 | ナノグラファイト球状体とその製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 8 | 3432818 (2003/5/23) | 飯島澄男 湯田坂雅子 小海文夫 | ナノホーン担持体とその製造方法 | (独)科学技術振興機構、 日本電気株 | 日本 |

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|----|-------------------------|---|-----------------------------|--------------------------|--------------|
| | | 高橋邦充 | | 株式会社、 (財)産業創造研究所 | |
| 9 | 3989256 (2007/7/27) | 飯島澄男 湯田坂雅子 小海文夫 高橋邦充 糟屋大介 金子克己 村田克之 | カーボンナノホーン 吸着材とその製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 10 | 3537811 (2004/3/26) | 飯島澄男 湯田坂雅子 本郷 廣生 | 単層カーボンナノチューブの製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 11 | 3851276 (2006/9/8) | 飯島澄男 湯田坂雅子 張民芳 | 光照射によるカーボンナノチューブの構造選択法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 12 | 4394383 (2009/10/23) | 飯島澄男 村田克之 金子克美 湯田坂雅子 | 単層カーボンナノホーン吸着材およびその製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 13 | 4130385 (2008/5/30) | 飯島澄男 安嶋久美子 湯田坂雅子 | ゲスト分子を内包した単層カーボンナノチューブの製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 14 | 4572362 (2010/8/27) | 田中章浩 梅田一徳 鹿又美紀彦 飯島澄男 湯村守男 湯田坂雅子 | 炭素材料含有ポリイミド複合材料とその製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
| 15 | 4723829 (2011/4/15) | 飯島澄男 湯田坂雅子 村田克之 | 金属担持炭素材料の製造方法 | (独)科学技術振興機構、 日本電気株式会社 | 日本 |
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