

## 6. 研究成果リスト

### 原著論文

No	論文タイトル	著者氏名	論文掲載誌名, 発行情報
1	Fast Autooxidation of a Bis-Histidyl-Ligated Globin from the Anhydrobiotic Tardigrade, <i>Ramazzottius varieornatus</i> , by Molecular Oxygen	Kazuo Kobayashi, JeeEun Kim, Yohta Fukuda, Takahiro Kozawa and Tsuyoshi Inoue	J. Biochem. 169 663-673(2021 1)
2	Dissolution kinetics of main-chain-scission-type resist in organic developers	Ayako Nakajima, Keiko Matsuo and Takahiro Kozawa	Appl. Phys. Express 14 026501(2021 1)
3	Application of Ethyltrimethylammonium Hydroxide (ETMAH) as an Alternative Developer Solution / Process for Semiconductor Lithography	Julius Joseph Santillan, Masahiko Harumoto, Tomohiro Motono, Andreia Figueiredo dos Santos, Chisayo Mori, Yuji Tanaka, Harold Stokes, Masaya Asai and Toshiro Itani	Jpn. J. Appl. Phys. 60 SCCC01(2021 2)
4	Application of machine learning to stochastic effect analysis of chemically amplified resists used for extreme ultraviolet lithography	Kazuki Azumagawa and Takahiro Kozawa	Jpn. J. Appl. Phys. 60 SCCC02(2021 3)
5	Pattern collapse mitigation by controlling atmosphere during development process for semiconductor lithography	Masahiko Harumoto, Tomohiro Motono, Andreia Figueiredo dos Santos, Chisayo Mori, Yuji Tanaka, Harold Stokes, Masaya Asai, Julius Joseph Santillan, Toshiro Itani, and Takahiro Kozawa	Jpn. J. Appl. Phys. 60 SCCA03(2021 4)
6	Estimation of electron affinity of photoacid generators: density functional theory calculations using static and dynamic models	Kazumasa Okamoto and Takahiro Kozawa	Jpn. J. Appl. Phys. 60 SCCC03(2021 4)

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7	Effect of initial molecular weight distribution on pattern formation of main-chain-scission-type resists	Ayako Nakajima, Manabu Hoshino and Takahiro Kozawa	Jpn. J. Appl. Phys. 60 056501(2021 4)
8	Dependence of dose rate on the sensitivity of the resist under ultra-high flux extreme ultraviolet (EUV) pulse irradiation	Kazumasa Okamoto, Shunpei Kawai , Yuta Ikari , Shigeo Hori, Akihiro Konda, Koki Ueno, Yohei Arai, Masahiko Ishino, Thanh-Hung Dinh, Masaharu Nishikino, Akira Kon, Shigeaki Owada, Yuichi Inubushi, Hiroo Kinoshita and Takahiro Kozawa	Applied Physics Express 14 066502 (2021 5)
9	Analysis of dissolution kinetics of narrow polydispersity poly(4-hydroxystyrene) in alkaline aqueous solution using machine learning	Naoki Tanaka, Kyoko Watanabe, Kyoko Matsuoka, Kazuki Azumagawa, Takahiro Kozawa, Takuya Ikeda, Yoshitaka Komuro and Daisuke Kawana	Jpn. J. Appl. Phys. 60 066503(2021 5)
10	Electron Beam Irradiation of Lead Halide Perovskite Solar Cells: Dedoping of Organic Hole Transport Materials despite Hardness of the Perovskite Layer	Yoshiyuki Murakami, Fumitaka Ishiwari, Kazumasa Okamoto, Takahiro Kozawa and Akinori Saeki	ACS Applied Materials & Interfaces 13 24824-24832(2021 5)
11	Study on radical dianions of carboxylates used as ligands of metal oxide nanocluster resists	Kengo Ikeuchi, Yusa Muroya, Takuya Ikeda, Yoshitaka Komuro, Daisuke Kawana and Takahiro Kozawa	Jpn. J. Appl. Phys. 60 076503(2021 6)
12	Resist Thickness Dependence of Latent Images in Chemically Amplified Resists Used for Electron Beam Lithography,	Takahiro Kozawa and Takao Tamura	J. Photopolym. Sci. Technol. 34 17-25(2021 6)

No	論文タイトル	著者氏名	論文掲載誌名, 発行情報
13	Non-chemically Amplified Negative Molecular Resist Materials using Polarity Change by EUV Exposure,	K. Fujisawa, H. Maekawa, H. Kudo, K. Okamoto, and T. Kozawa,	J. Photopolym. Sci. Technol. 34 87-93(2021 6)
14	Analysis of mitigating factors for line edge roughness generated during electron beam lithography using machine learning	Yuqing Jin, Takahiro Kozawa and Takao Tamura	Jpn. J. Appl. Phys. 60 076509(2021 7)
15	Theoretical study of interfacial effects on low-energy electron dynamics in chemically amplified resist processes of photomask fabrication	Takahiro Kozawa and Takao Tamura	Jpn. J. Appl. Phys. 60 086503(2021 7)
16	Scavenging of "dry" electrons prior to hydration by azide ions: Effect on the formation of H <sub>2</sub> in the radiolysis of water by <sup>60</sup> Co $\gamma$ -rays and tritium $\beta$ -electrons.	Sunuchakan Sanguanmith, Jintana Meesungnoen, Yusa Muroya and Jean-Paul Jay-Gerin	Can. J. Chem. 99 881-889(2021 6)
17	$\gamma$ -Radiation synthesis of ultrasmall noble metal (Pd, Au, Pt) nanoparticles embedded on boron nitride nanosheets for high-performance catalysis	Yi Wang, Jialiang Chen, Lan Wang, Hanqin Weng, Zhihao Wu, Limin Jiao. Yusa Muroya, Shinichi Yamashita, Sheng Cheng, Fuhai Li, Hongbing Chen, Wei Huang and Mingzhang Lin	Ceramics International 47 26963-26970(2021 10)
18	Relationship between blurring factors and interfacial effects in chemically amplified resist processes in photomask fabrication	Takahiro Kozawa and Takao Tamura	Jpn. J. Appl. Phys. 60 126504(2021 12)

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19	Relationship between surface free energy and development process (swelling and dissolution kinetics) of poly(4-hydroxystyrene) film in water and 2.38 wt% tetramethylammonium hydroxide aqueous solution	Yuko Tsutsui Ito and Takahiro Kozawa	Jpn. J. Appl. Phys. 61 016502(2021 12)
20	Formulation of trade-off relationships between resolution, line edge roughness, and sensitivity in sub-10 nm half-pitch region for chemically amplified extreme ultraviolet resists	Takahiro Kozawa	Jpn. J. Appl. Phys. 61 016501(2021 12)
21	Photo- & radio-chromic iron-doped tungstic acids fabricated via submerged photosynthesis	Shuntaro Murakami, Lihua Zhang, Melbert Jeem, Kazumasa Okamoto, Yuki Nakagawa, Tamaki Shibayama, Masato Ohnuma, Seiichi Watanabe	Optical Materials 124 111966(2022 1)
22	Fabrication of color-toned micro/nanopattern surface by submerged photosynthesis method	Jumpei Tsukamura, Yuki Takahashi, Lihua Zhang, Melbert Jeem, Kazumasa Okamoto, Seiichi Watanabe	Microelectronic Engineering 256 111727(2022 2)
23	Effects of film thickness and alkaline concentration on dissolution kinetics of poly(4-hydroxystyrene) in alkaline aqueous solution	Naoki Tanaka, Kyoko Matsuoka, Takahiro Kozawa, Takuya Ikeda, Yoshitaka Komuro and Daisuke Kawana	Jpn. J. Appl. Phys. (2022 )
24	Decarboxylation efficiency of carboxylic acids as ligands of metal oxide nanocluster resists upon $\gamma$ -ray irradiation	Tomoe Otsuka, Yusa Muroya, Takuya Ikeda, Yoshitaka Komuro, Daisuke Kawana and Takahiro Kozawa	Jpn. J. Appl. Phys. 61 036503(2022 3)

No	論文タイトル	著者氏名	論文掲載誌名, 発行情報
25	Classification of lines, spaces, and edges of resist patterns in scanning electron microscopy images using unsupervised machine learning	Yuqing Jin and Takahiro Kozawa	Jpn. J. Appl. Phys. (2022)
26	Effect of surface free energy of organic underlayer on dissolution kinetics of poly(4-hydroxystyrene) film in tetramethylammonium hydroxide aqueous developer	Tomoe Otsuka, Yuqing Jin, Naoki Tanaka, and Takahiro KOZAWA	Jpn. J. Appl. Phys. (2022)
27	Interdomain Electron Transfer in Flavohemoglobin from <i>Candida norvegensis</i> with Antibiotic Azole Compounds	Kazuo Kobayashi, Jotaro Igarashi, and Takahiro Kozawa	FEBS Letters (2022 3)
28	Electron Beam Chirp Dexterity in Staging Laser Wakefield Acceleration	N. Pathak, A. Zhidkov and T. Hosokai	the Physics of Plasmas 28 5 053105(1-10)(2021 5)
29	サブナノ秒マイクロチップレーザーによるレーザーピーンフォーミングの変形特性	鷺坂芳弘、川崎泰介、Vincent YAHIA、平等拓範、佐野雄二	塑性と加工（日本塑性加工学会論文誌） 62 720 8-13(2021 1)
30	Effects of Laser Peening with a Pulse Energy of 1.7 mJ on the Residual Stress and Fatigue Properties of A7075 Aluminum Alloy	Yuji Sano, Kiyotaka Masaki, Yoshio Mizuta, Satoshi Tamaki, Tomonao Hosokai and Takunori Taira	Metals 11 11 1-9(2021 10)
31	Effect of Laser Peening with a Microchip Laser on Fatigue Life in Butt-Welded High-Strength Steel	Tomoharu Kato, Yoshihiro Sakino, Yuji Sano	Applied Mechanics 2 4 878-890(2021 2)
32	Development of a portable laser peening device and its effect on the fatigue properties of HT780 butt-welded joints	Yuji Sano, Tomoharu Kato, Yoshio Mizuta, Satoshi Tamaki, Koki Yokofujita, Takunori Taira, Tomonao Hosokai, Yoshihiro Sakino	Forces in Mechanics 7 - 100080-100086(2022 2)
33	Effect of pulse group velocity on charge loading in laser wakefield acceleration	N. Pathak, A. Zhidkov and T. Hosokai	Physics Letters A 425 j.physleta.2021 127873(1-7)(2021 11)

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34	Experimental demonstration of 7-femtosecond electron timing fluctuation in laser wakefield acceleration	Kai Huang, Zhan Jin, Nobuhiko Nakanii, Tomonao Hosokai and Masaki Kando	Applied Physics Express 15 3 (2022 2)
35	Time-domain measurement of coherent transition radiation using a photoconductive antenna with micro-structured electrodes	K. Kan, M. Gohdo, J. Yang, I. Nozawa, Y. Yoshida, H. Kitahara, K. Takano, R. Kuroda, H. Toyokawa	AIP ADVANCES 11 12 (2021 12)
36	Longitudinal and transverse spatial beam profile measurement of relativistic electron bunch by electro-optic sampling	Masato Ota, Koichi Kan, Soichiro Komada, Yasunobu Arikawa, Tomoki Shimizu, Valynn Katrine Mag-usara, Youichi Sakawa, Tatsunosuke Matsui, and Makoto Nakajima	Applied Physics Express 14 2 026503(2021 1)
37	Optimization of a B4C/graphite composite energy degrader and its shielding for a proton therapy facility	Zhiyuan Mei, Kuanjun Fan, Zhikai Liang, Jinfeng Yang, Mingwu Fan	Nuclear Instrument and Methods in Physics Research, A 995 165127(2021 2)
38	相対論的フェムト秒パルス電子顕微鏡の開発	楊 金峰, 保田 英洋, 吉田 陽一	加速器 18 3 81-88(2021 7)
39	Magnetic Domain Control of ErFeO3 by Intense Terahertz Free Electron Laser Pulses	M. Nakajima, G. Isoyama, and T. Kurihara	IEEE Transactions on Plasma Science 49 3344-3350(2021 11)
40	Examining features of radiation-induced damage to PADC observed using FT-IR analysis: Radiation tolerance of methine groups at three-way junctions	T.Kusumoto, M. Kanasaki, I. Ishikawa, R. Barillon, Y. Honda, S. Tojo, S. Kodaira and T. Yamauchi	Radiation Measurements 147 106645(2021 9)
41	Electronic and Structural Properties of 2,3-Naphthalimide in Open-Shell Configurations Investigated by Pulse Radiolytic and Theoretical Approaches	B Zhuang, S Tojo and M. Fujitsuka	ChemistrySelect Vol. 6 No. 14, pp. 3331–3338 (2021)

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42	Stacked thiazole orange dyes in DNA capable of switching emissive behavior in response to structural transitions	Tadao Takada, Koma Nishida, Yurika Honda, Aoi Nakano, Mitsunobu Nakamura, Shuya Fan, Kiyohiko Kawai, Mamoru Fujitsuka, and Kazushige Yamana	ChemBioChem Vol. 22 No. 17, pp. 2729–2735 (2021).
43	A cyanine dye based supramolecular photosensitizer enabling visible-light-driven organic reaction in water	Hajime Shigemitsu, Tomoe Tamemoto, Kei Ohkubo, Tadashi Mori, Yasuko Osakada, Mamoru Fujitsuka, and Toshiyuki Kida	Chemical Communications Vol. 57 No. 85, pp. 11217–11220 (2021)
44	One-pot synthesis of long rutile TiO <sub>2</sub> nanorods and their photocatalytic activity for O <sub>2</sub> evolution: comparison with near spherical nanoparticles	Suzuko Yamazaki, Masanari Kutoh, Yukari Yamazaki, Nanami Yamamoto, and Mamoru Fujitsuka	ACS Omega, Vol. 6 No. 47, pp. 31557–31565 (2021)
45	Effects of Bi-dopant and co-catalysts upon hole surface trapping on La <sub>2</sub> Ti <sub>2</sub> O <sub>7</sub> nanosheet photocatalysts in overall solar water splitting	Xiaoyan Cai, Liang Mao, Mamoru Fujitsuka, Tetsuro Majima, Sujan Kasani, Nianqiang Wu, and Junying Zhang	Nano Research, Vol. 15 No. 1, pp. 438–445 (2022)
46	Single-molecule fluorescence kinetic sandwich assay using a DNA sequencer	Kiyohiko Kawai and Mamoru Fujitsuka	Chemistry Letters Vol. 51 No. 2, pp. 139–141 (2022)
47	Enhanced photocatalytic activity of porphyrin nanodisks prepared by exfoliation of metalloporphyrin-based covalent organic frameworks	Xinxi Li, Kota Nomura, Arnaud Guedes, Tomoyo Goto, Tohru Sekino, Mamoru Fujitsuka, and Yasuko Osakada	ACS Omega, Vol. 7 No. 8, pp. 7172–7178 (2022)

総説

No	タイトル	著者氏名	掲載誌名, 発行情報
1	COF-based photocatalyst for energy and environment applications	Xinxi Li, Kiyohiko Kawai, Mamoru Fujitsuka, and Yasuko Osakada	Surfaces and Interfaces, Vol. 25, pp. 101249 (2021)