

1. 受賞

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|-------|--|
| 入江 正浩 | Theodor-Förster Preis 2008 (GDCh and Deutsche Bunsen-Gesellschaft, Germany) 2008年10月 |
| | Karl Friedrich Bonhoeffer Medal (Max-Planck-Institute, Germany) 2008年10月 |
| 山中 正浩 | Molecular Chirality ASIA 2012 ポスター賞 (海津溪介) 2012年5月 |
| 大山 秀子 | プラスチック成形加工学会秋季大会成形加工シンポジア'11 ベストポスター賞 (奈良沙織) 2011年11月 |

2. 新聞・メディア報道等

2-1. 新聞報道

| | | | |
|-------|-------------|--------------------------------------|-----------|
| 望月 祐志 | 日経産業新聞 | スパコンで創薬 「量子化学で作用計算」 | 2010/8/11 |
| | 日本経済新聞 | 新薬設計の精度5倍 立教大など 薬効、素早く判断 | 2011/6/20 |
| | 日経産業新聞 | スパコンで創薬設計 効果素早く判断 開発期間を短縮 | 2011/6/21 |
| | 日経産業新聞 | ITが導く医の進化論 スパコン創薬「京」 の号砲 | 2011/9/13 |
| | 日刊工業新聞 | たんぱく質・医薬候補物質の相性 高速・ 高精度に解析 | 2012/3/27 |
| | 化学工業日報 | 官能基の相互作用解析 創薬支援の新手 法 立教大など | 2012/3/27 |
| 常盤 広明 | 薬事日報 | 酵素は何をしているのか? 新世紀の科 学が解き明かす分子メカニズム | 2012/3/21 |
| 入江 正浩 | 朝日新聞 (夕刊) | 皇居で「講書始の儀」 | 2009/1/9 |
| | 日本経済新聞 (夕刊) | 皇居で「講書始の儀」 | 2009/1/9 |
| | 読売新聞 (夕刊) | 皇居で「講書始の儀」 | 2009/1/9 |
| | 東京新聞 (夕刊) | 皇居で両陛下「講書始の儀」 | 2009/1/9 |
| | 毎日新聞 (夕刊) | 「講書始の儀」を益川さんが傍聴 | 2009/1/9 |
| | 産経新聞 | 「講書始の儀」益川教授も傍聴 | 2009/1/10 |

2-2. テレビ放映・情報雑誌・ネットメディア

| | | | |
|-------|-----------------------|---|------------|
| 入江 正浩 | NHK ニュース | 講書始 両陛下に研究者が講義 | 2009/1/9 |
| | MSN 産経ニュース | 皇居で「講書始の儀」益川教授も傍聴 | 2009/1/9 |
| | Chem-Station | 光で形を変える結晶 | 2009/7/8 |
| | RSC Chemistry World | Weightlifting Crystals | 2010/9/30 |
| | PHYSORG.COM | Crystal cantilever lifts objects 600 times its own weight | 2010/10/1 |
| | Chem-Station | 結晶世界のウェイトリフティング | 2010/12/11 |
| | Wiley Chemistry Views | Bow Down to the Light | 2011/11/21 |
| | ワイリーサイエンスカフェ | 光駆動アクチュエーター | 2011/11/22 |
| | Photonics Spectra | Light-triggered robotic arm bends, stretches | 2012/2 |
| | JACS Select #14 | Advances at the Frontiers of Photochemical Sciences | 2012/5/23 |

3. 学術雑誌の表紙掲載・重要論文

| | | |
|-------|--|---------|
| 望月 祐志 | Chem. Phys. Lett.誌：表紙 | 2010/4 |
| 山高 博 | Faraday Discuss.誌：表紙 | 2010/4 |
| 入江 正浩 | Bull. Chem. Soc. Jpn.誌：表紙 | 2008/8 |
| | Photochem. Photobiol. Sci 誌：表紙 | 2010/8 |
| | J. Am. Chem. Soc. 2010, <u>132</u> , 14172: JACS Select #14 (Advances at the Frontiers of Photochemical Sciences) | 2012/5 |
| | J. Am. Chem. Soc. 2011, <u>133</u> , 2621: JACS Select #14 (Advances at the Frontiers of Photochemical Sciences) | 2012/5 |
| | Angew. Chem. Int. Ed.誌：中表紙 | 2012/1 |
| | Angew. Chem. Int. Ed. 2012, <u>51</u> , 901: Hot Paper | 2012/1 |
| 山中 正浩 | J. Org. Chem. 2009, <u>74</u> , 3266: Featured Article | 2009/5 |
| 大山 秀子 | Polymer J. 2011, <u>43</u> , 991: Highlight Paper | 2011/12 |
| 和田 亨 | Dalton Trans. 2011, <u>40</u> , 2225: Invited paper | |

4. シンポジウム等の主催

| | | |
|-------|---|--------|
| 常盤 広明 | 日本薬学会第 131 大会シンポジウム主催「新世紀の創薬を支える現代化学とマルチスケールシミュレーション」 | 2011/3 |
| 松下 信之 | 第 60 回錯体化学討論会シンポジウム主催「クロモトロピック金属錯体の最前線」 | 2010/9 |

新聞記事 (2-1)



「講書始の儀」
 菅野教授も傍聴
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日経産業新聞 2011/6/21



日経産業新聞 2010/8/11



日経産業新聞 2011/9/13



日本経済新聞 2011/6/20



たんぱく質・医薬候補物質の相性

高速・高精度に解析

美大生研など

京都大学大学院の藤田 隆弘教授らの研究グループが、たんぱく質と医薬候補物質の相性を高精度で解析する新しい手法を開発した。従来の手法では、たんぱく質と医薬候補物質の相性を解析するために、たんぱく質と医薬候補物質を混合し、その混合物の構造を解析していた。しかし、この手法では、たんぱく質と医薬候補物質の相性を高精度で解析することができなかった。藤田教授らの研究グループは、たんぱく質と医薬候補物質の相性を高精度で解析するために、新しい手法を開発した。この手法では、たんぱく質と医薬候補物質の相性を高精度で解析することが可能である。

官能基の相互作用解析

互換性化合物 創薬支援の手法 立教大など

立教大学大学院の藤田 隆弘教授らの研究グループが、官能基の相互作用を解析する新しい手法を開発した。従来の手法では、官能基の相互作用を解析するために、官能基と官能基を混合し、その混合物の構造を解析していた。しかし、この手法では、官能基と官能基の相互作用を高精度で解析することができなかった。藤田教授らの研究グループは、官能基と官能基の相互作用を高精度で解析するために、新しい手法を開発した。この手法では、官能基と官能基の相互作用を高精度で解析することが可能である。

酵素は何をしているのか?

新世紀の科学が解き明かす

分子メカニズム

常盤 広明 北垣 和夫

酵素は、生体内でさまざまな化学反応を促進する重要なタンパク質である。酵素の働きを解き明かすことは、創薬や医療に大きく貢献する。常盤広明教授と北垣和夫教授のチームが、酵素の働きを分子メカニズムレベルで解析する新しい手法を開発した。この手法では、酵素の働きを高精度で解析することが可能である。

テレビ放映・情報雑誌・ネットメディア（2-2）



NHK ニュース 2009/1/9



MSN産経ニュース 2009/1/9

19時00分

天皇皇后両陛下が年の初めにさまざまな分野の研究者から講義を受けられる「講書始」が皇居で行われました。

「講書始」は午前10時半から皇居・宮殿の「松の間」で行われ、両陛下は、皇族方やノーベル物理学賞を受賞した益川敏英さんなど学術関係者とともに講義を受けられました。はじめに、京都大学の吉川忠夫名誉教授が、1世紀半ばに中国に伝来したとされる仏教が500年ほどかけて中国国内で定着していくまでの過程などについて説明しました。経営学が専門の東京理科大学の伊丹敬之教授は、経済が厳しい状況に追い込まれているなか、日本を奮めた世界の企業の素晴らしい取り組みの一つについて説明しました。立教大学理学部の人江正志教授は「光に反応する分子」というテーマで講義を行い、光が当たると色や形を変える化学物質について解説しました。3人の研究者の講義はおよそ45分におたって行われ、両陛下は熱心に耳を傾けられました。

PHYSORG.COM 2010/10/1



Crystal cantilever lifts objects 600 times its own weight (w/ Video)

Under an X-ray beam, a cantilever beam can be used to lift objects up to 600 times its own weight. When the crystal cantilever is illuminated with UV light from below, it bends away from the light, and then returns to its original shape upon visible light irradiation. (Right) When the crystal cantilever is illuminated with UV light from below, it bends away from the light, and then returns to its original shape upon visible light irradiation. (Left) When the crystal cantilever is illuminated with UV light from below, it bends away from the light, and then returns to its original shape upon visible light irradiation.

(PhysOrg.com) — For a long time, scientists have been trying to translate the collective movements of tiny molecules into useful mechanical work. With this goal in mind, a team of researchers from Japan has developed a crystal cantilever that exhibits reversible bending upon alternate irradiation with ultraviolet (UV) and visible light. They've demonstrated that the crystal cantilever can lift several light, that weigh up to 600 times more than the cantilever itself. In this process, the crystal's photochemical molecular-scale shape change generates a very large amount of stress — more than 100 times larger than the stress produced by biological muscles — to induce the macroscopic movement.

Masahiko Minoura and Masahito Iino from Rikkyo University of Tokyo, Japan, and the Japan Science and Technology Agency, have published their study on the crystals in a recent issue of the journal of *Optics Express*.

RSC Chemistry World 2010/9/30

RSC Publishing the Journal of Chemistry Education

Weightlifting crystals

19 September 2010

Scientists have recently developed a crystal that can lift objects up to 600 times its own weight. This is achieved by using UV light to bend the crystal away from the light, and then returning it to its original shape upon visible light irradiation. The crystal can lift objects up to 600 times its own weight, which is a significant achievement for a crystal cantilever. This is achieved by using UV light to bend the crystal away from the light, and then returning it to its original shape upon visible light irradiation. The crystal can lift objects up to 600 times its own weight, which is a significant achievement for a crystal cantilever.

Chem-Station 2009/7/8

化学者のつぶやき

化学者のつぶやき

Chem-Station 2010/12/11

化学者のつぶやき

化学者のつぶやき

Bow Down to the Light

Author: Angewandte Chemie International Edition
Published Date: 21/11/2011
Source / Publisher: Angewandte Chemie International Edition/Wiley-VCH
Copyright: Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim



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As instrumentation progresses, microbots and nanomachines have moved beyond the realm of pure speculation. The technology requires tiny components. Full can respond to stimulation by undergoing controlled movements. Photochromic molecules are known to change a bending motion when subjected to an acidic fluid. Increase the volume required and a laser is tomorrow's application or threat. In light, in the journal *Angewandte Chemie*, a research team led by Masahiro Iino at Witsup University, Tokyo, Japan, has now introduced a photochromic microbot that can be triggered to bend and contract by light.

The tiny robotic arms are made of a polymer shaped like micro- or millimeter-sized fish tails. When they are irradiated with UV light (365 nm), the rods bend toward the light source, when irradiated with visible light (480 nm) they stretch back into their original straight shape.

everywhere Division

What causes the bending motion? The molecules in the crystals are an organic-inorganic system containing five rings. The central aromatic unit is a bicyclic group. UV light induces rearrangement of five chemical bonds (isomerization) and causes a ring closure within the molecule. This results in the shape change of such molecules, which leads to a geometric change of the crystal. The crystal contracts, but only where it was exposed to the UV light, that is, on the outer layer of the irradiated side of the rod. This causes bending similar to that of a flexible arm. Visible light engenders the reverse reaction, the newly formed single ring opens, the original crystal structure is restored, and the crystal straightens out.

Light-triggered robotic arm bends, stretches

WIT In the world of micro-robotics, microbots and nanomachines have moved beyond the realm of pure speculation. The technology requires tiny components. Full can respond to stimulation by undergoing controlled movements. Photochromic molecules are known to change a bending motion when subjected to an acidic fluid. Increase the volume required and a laser is tomorrow's application or threat. In light, in the journal *Angewandte Chemie*, a research team led by Masahiro Iino at Witsup University, Tokyo, Japan, has now introduced a photochromic microbot that can be triggered to bend and contract by light.

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ワイリーサイエンスカフェ 2011/11/22

ワイリーサイエンスカフェ
2011年11月22日（火）18時-19時
会場：ワイリーサイエンスカフェ
5F

光駆動マイクロボット - 立命館-入江正彦特任教授からのACI研究会Chemistry Viewsが紹介

2011.11.22 18:00-19:00

立命館大学理学部化学科・先端科学研究所センターユニット 立江正彦特任教授の研究室から「Bow Down to the Light」と題して、光駆動マイクロボットに関する最新研究について紹介いたします。光駆動マイクロボットは、光によって形状を変化させることで、微小スケールで移動や作業を行うことが期待されています。立江正彦教授の研究チームは、光によって形状を変化させることで、微小スケールで移動や作業を行うことが期待されています。立江正彦教授の研究チームは、光によって形状を変化させることで、微小スケールで移動や作業を行うことが期待されています。



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Wang, F., Yoshizawa, H., and Iino, M. (2011) Light-Driven Robotic Crystal Systems: Rapid and Reversible Bending of Self-Organized Photochromic Crystals. *Angewandte Chemie International Edition*, doi: 10.1002/anie.201102070

立命館大学理学部化学科

http://www.wiley-vch.com

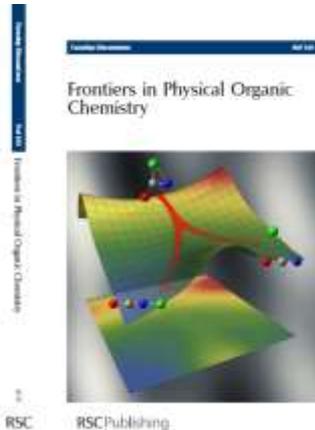
ワイリーサイエンスカフェ

学術雑誌の表紙・重要論文（3）

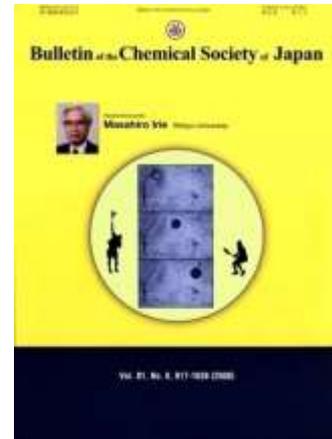
Chem. Phys. Lett. 2010/4



Faraday Discuss. 2010/4



Bull. Chem. Soc. Jpn. 2008/8



Photochem. Photobiol. Sci. 2010/8



Angew. Chem. Int. Ed. 2012/1



A Diarylethene-Crosslinker That Converts Light Into Mechanical Work

Yoshitaka Yamamoto* and Yukihiro Hirono

Department of Chemistry, Faculty of Science, Shizuoka University, 52-8366
8366, Shizuoka 422-8529, Japan

ABSTRACT: The photochemical effect of a crosslinker plays an important role in the development of photoresponsive materials. In this study, we report a diarylethene derivative that can be reversibly converted to a crosslinker by light irradiation. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network.

INTRODUCTION

In a very simple, reversible, and efficient manner, the photochemical reaction of a diarylethene derivative can be used to control the mechanical properties of a polymer network. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network.

One-Color Reversible Control of Photochromic Reactions in a Diarylethene Derivative: Three-Photon Cyclization and Two-Photon Cycloreversion by a Near-Infrared Femtosecond Laser Pulse at 1.28 μm

Kazuo Mori, Yoshitaka Yamamoto, Yukihiro Hirono, Takashi Suganuma, Shunichi Nakagawa, Kazuo Mori, Yoshitaka Yamamoto, Yukihiro Hirono, Takashi Suganuma, Shunichi Nakagawa

Department of Chemistry, Faculty of Science, Shizuoka University, 52-8366, Shizuoka 422-8529, Japan

ABSTRACT: The photochemical reaction of a diarylethene derivative can be controlled by light irradiation. In this study, we report a diarylethene derivative that can be reversibly converted to a crosslinker by light irradiation. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network.



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Light-Driven Molecular-Crystal Anisotropy: Rapid and Reversible Healing of Rod-Like Mixed Crystals of Diarylethene Derivatives*

Yoshitaka Yamamoto, Yukihiro Hirono, Takashi Suganuma, Shunichi Nakagawa

Department of Chemistry, Faculty of Science, Shizuoka University, 52-8366, Shizuoka 422-8529, Japan

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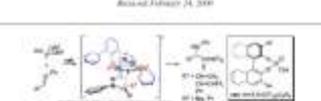


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HFT Study on Difunctional Chiral Brominated Acid-Catalyzed Asymmetric Hydrophosphorylation of Imines

Yoshitaka Yamamoto* and Yukihiro Hirono

Department of Chemistry, Faculty of Science, Shizuoka University, 52-8366, Shizuoka 422-8529, Japan



Asymmetric hydrophosphorylation reaction of imines with diethyl phosphite proceeds efficiently by using a chiral brominated acid derived from (S)-BINOL. The chiral brominated acid is derived from chiral brominated amines and is used to catalyze the asymmetric hydrophosphorylation of imines. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network.

High performance reactive blends composed of poly(p-phenylene sulfide) and ethylene copolymers

Yoshitaka Yamamoto, Yukihiro Hirono, Takashi Suganuma, Shunichi Nakagawa

Department of Chemistry, Faculty of Science, Shizuoka University, 52-8366, Shizuoka 422-8529, Japan

The photochemical reaction of a diarylethene derivative can be controlled by light irradiation. In this study, we report a diarylethene derivative that can be reversibly converted to a crosslinker by light irradiation. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network.

Substituent dependent capability of bis(anthracene-diolone-oxypiperidin) complexes toward water oxidation*

Yoshitaka Yamamoto, Yukihiro Hirono, Takashi Suganuma, Shunichi Nakagawa

Department of Chemistry, Faculty of Science, Shizuoka University, 52-8366, Shizuoka 422-8529, Japan

The photochemical reaction of a diarylethene derivative can be controlled by light irradiation. In this study, we report a diarylethene derivative that can be reversibly converted to a crosslinker by light irradiation. The photochemical reaction of the diarylethene derivative is reversible and can be used to control the mechanical properties of a polymer network.