

Electrochromism synchronous to the charge/discharge of a novel Li ion battery having  $\text{Li}_3\text{Fe}_2(\text{PO}_4)_3$  and  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  thin-film electrodes fabricated by a chemical process, the molecular precursor method, was discovered. A cathode of transparent  $\text{Li}_3\text{Fe}_2(\text{PO}_4)_3$  thin film with a thickness of 80 nm was fabricated by heat treating a precursor ethanol solution ...

A novel thin-film lithium-ion battery (LIB) which can be charged by the light irradiation was fabricated by molecular precursor method. The unprecedented, translucent thin-film LIB, fabricated on a fluorine-doped tin oxide pre-coated glass substrate, was attained by using the active materials, titania for anode and  $\text{LiCoO}_2$  for cathode, respectively. The ...

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Functional thin films are used in various fields of our life. Many different methods are used to fabricate these films including physical vapor deposition (PVD) and chemical processes. The chemical processes can be used to manufacture thin films in a relatively cheap way, as compared to PVD methods. This chapter summarizes the procedures of the molecular ...

Photovoltaic Lithium-ion Battery with Layer-Structured  $\text{Li}_2\text{MnIII}_0.2\text{MnIV}_0.8\text{O}_{2.9}$  Thin Film Chemically Fabricated for Cathodic Active Material ... Metal Complex Molecular Precursor Method Counter Ion ...

The rapid design of advanced materials depends on synthesis parameters and design. A wide range of materials can be synthesized using precursor reactions based on chelated gel and organic polymeric gel pathways. The desire to develop high-performance lithium-ion rechargeable batteries has motivated decades of research on the synthesis of battery ...

**1.2 Molecular Precursor Method** In 1996, one of the authors, M.S., focused on the thin-film fabrication of various metal oxides and phosphate compounds using the stable metal complexes [4-54]. This is the Molecular Precursor Method (MPM), which is one of the chemical processes used for thin-film fabrication. In those days, most of the

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# Photovoltaic lithium-ion battery fabricated by molecular precursor method

Photovoltaic lithium-ion battery fabricated by molecular precursor method. Article. Apr 2016; ... (LIB) which can be charged by the light irradiation was fabricated by molecular precursor method ...

The molecular precursor method is useful to obtain the active materials for the novel device which functioned as the lithium-ion battery, photovoltaic lithium-ion battery, and the solar cell. This is the original report on translucent, thin-film LIB that can be charged by solar light irradiation was fabricated using active materials on a ...

Recently, we reported on the fabrication of a new photovoltaic lithium-ion battery (PV-LIB) with  $\text{LiCoO}_2$  (LCO) and titania thin films for cathodic and anodic active materials, respectively. These materials were fabricated on a fluorinated-tin-oxide (FTO) pre-coated glass substrate using the molecular precursor method (MPM) [1].

Sol-gel  $\text{TiO}_2$ - $\text{SiO}_2$  films were deposited on 316L stainless steel by dip coating process from a sono-catalysed sol of composition 30 $\text{TiO}_2$ -70 $\text{SiO}_2$  prepared from a mixture of  $\text{Ti}(\text{OC}_2\text{H}_5)_4$  and  $\text{Si}(\text{OC}_2\text{H}_5)_4$  ...

We have reported the fabrication of a thin-film LIB using the molecular precursor method. The thin-film LIB was fabricated with  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  for the anode and  $\text{Li}_3\text{Fe}_2(\text{PO}_4)_3$  for the cathode on a fluorine-doped tin oxide pre-coated glass substrate and an electrolyte of dissolved  $\text{LiPF}_6$  . ... Photovoltaic Lithium-ion Battery with Layer ...

The molecular precursor method is an effective, wet chemical process that was developed by the current authors, for fabricating nano-crystalline thin films of metals and, various metal oxides ...

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The heterometallic diketonate 1 was shown to exhibit clean, low-temperature decomposition in air/oxygen that results in nanosized particles of spinel-type oxide  $\text{LiMn}_2\text{O}_4$ , one of the leading cathode materials for lithium ion batteries. The first single-source molecular precursor for a lithium-manganese cathode material is reported. Heterometallic  $\alpha$ -diketonate ...

A  $\text{LiCoO}_2$  thin film on a quartz glass substrate was fabricated by a wet process involving heat treatment of a precursor film spray-coated with an aqueous ammonia solution containing  $\text{LiCH}_3\text{COO}$  and  $\text{Co}(\text{CH}_3\text{COO})_2$ . The precursor film formed onto the substrate at 180  $^\circ\text{C}$  in air, and was heat treated at 500  $^\circ\text{C}$  in air for 0.5 h. The obtained film was spin-coated further with an ...

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Silicon-carbon (Si@C) composites are emerging as promising replacements for commercial graphite in lithium-ion battery (LIB) anodes. This study focuses on the development of Si@C composites using silicon waste from photovoltaic industry kerf loss (KL) as a source for LIB anodes. We extracted purified nanosilicon powder from KL Si wastes through a combined ...

Dilithium manganese oxide (LMO) thin film was newly fabricated as an active material on a fluorinated-tin-oxide pre-coated glass electrode by a wet process. A stable LMO precursor solution was developed through the reaction of lithium and manganese acetates with butylamine in ethanol. A spin-coated precursor film was heat-treated at  $500 \pm 176^\circ\text{C}$  in air for 0.5 h. ...

An advanced polyimide (C-PI) separator was designed by the co-precursor method and molecular structure designation. o The C-PI separator possessed high porosity, good flexibility, excellent thermal stability, and superior electrolyte wettability. o Lithium-ion battery with C-PI separator demonstrated 93.6% retention after 1000 cycles. o

Keywords: Photovoltaic device; lithium-ion batteries; translucent; molecular precursor method; thin film. Distributed power generation using renewable energy sources, such as solar light, can efficiently supply electricity according to on-site demand. If the electrodes of lithium-ion batteries (LIBs), which are the dominant power

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The copper telluride nanowires show promising performance in lithium ion battery with a discharge capacity of  $130.2 \text{ mA h g}^{-1}$  at a high current density of  $6.0 \text{ A g}^{-1}$  ( $26.74^\circ\text{C}$  ...

Nagai H, Suzuki T, Takahashi Y, Sato M. Photovoltaic lithium-ion battery fabricated by molecular precursor method. Functional Materials Letters. 2016; 9:1650046-1650041, 4. DOI: 10.1142/S1793604716500466; 54. Mochizuki C, Hara H, Takano I, Hayakawa T, Sato M. Application of carbonated apatite coating on a Ti substrate by aqueous spray method.



# **Photovoltaic fabricated method**      **by**      **lithium-ion molecular**      **battery precursor**

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