

Title (en)

Film forming material and preparation of surface relief and optically anisotropic structures by irradiating a film of the said material

Title (de)

Filmbildendes Material und Herstellung von Oberflächenrelief- und optisch anisotropen Strukturen durch Bestrahlen eines Films des filmbildenden Materials

Title (fr)

Matériau filmogène et préparation de structures à relief de surface et optiquement anisotropiques par irradiation du film formé à partir de ce matériau filmogène

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Application

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Priority

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Abstract (en)

The present invention relates to a film-forming, photoactive material comprising a complex prepared from (a) at least one ionic photosensitive compound which may undergo a photoreaction, selected from photoisomerizations, photocycloadditions and photoinduced rearrangements, wherein the photosensitive compound is of formula I or formula II $[R-P-R']_n + n/x A^x-$ (I) or $n/x A^x + [R-P-R']_n$ (II) wherein P is a group capable of photoisomerization, and R and R' are independently selected from optionally substituted or functionalised aryl-containing groups at least one of which is positively or negatively charged, A is an oppositely charged cation or anion, n is an integer, and x is 1, 2 or 3, and/or the photosensitive compound is of formula III or IV: $[R_1-Q-R_1']_n + n/x A^x-$ (III) or $n/x A^x + [R_1-Q-R_1']_n$ (IV) wherein Q is a group capable of participating in a photocycloaddition or photoinduced rearrangement reaction, and R₁ and R₁' are independently selected from optionally substituted or functionalized groups having electron-accepting properties and optionally substituted or functionalized aryl-containing groups and from such groups which together with Q form an aryl ring or heteroaryl ring, wherein either at least one of R₁ and R₁' is positively or negatively charged or the ring structure and/or a substituent thereon will carry at least one positive or negative charge, wherein A, n and x are defined as for formulae I and II, with the proviso that in all compounds of formulae (I) to (IV) contained in one complex, the charge of [R-P-R'] and/or [R₁-Q-R₁'] has the same sign, and (b) at least one polyelectrolyte carrying charges which are opposite to those of the active groups [R-P-R'] and/or [R₁-Q-R₁'] of the photosensitive material. If films prepared from this material are homogeneously or heterogeneously irradiated with polarized light, optical anisotropy and/or a surface relief structure may be reversibly or irreversibly induced in/on the films, depending on specific parameters detailed in the specification.

IPC 8 full level

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- [A] US 2003141441 A1 20030731 - KAWANO KATSUNORI [JP], et al
- [A] ZUCLOTTO V ET AL: "Mechanisms of surface-relief gratings formation in layer-by-layer films from azodyes", POLYMER, ELSEVIER SCIENCE PUBLISHERS B.V, GB, vol. 44, no. 20, September 2003 (2003-09-01), pages 6129 - 6133, XP004452528, ISSN: 0032-3861
- [A] OZAKI M ET AL: "PHOTOINDUCED SURFACE RELIEF GRATING ON COMPOSITE FILM OF CONDUCTINGPOLYMER AND POLYACRYLATE CONTAINIGN AZO-SUBSTITUENT", JAPANESE JOURNAL OF APPLIED PHYSICS, PUBLICATION OFFICE JAPANESE JOURNAL OF APPLIED PHYSICS. TOKYO, JP, vol. 39, no. 6B, PART 2, 15 June 2000 (2000-06-15), pages L614 - L616, XP001048939, ISSN: 0021-4922
- [A] HE Y ET AL: "Synthesis, self-assembly and photoinduced surface-relief gratings of a polyacrylate-based Azo polyelectrolyte", OPTICAL MATERIALS, ELSEVIER SCIENCE PUBLISHERS B.V. AMSTERDAM, NL, vol. 26, no. 1, June 2004 (2004-06-01), pages 89 - 93, XP004509450, ISSN: 0925-3467
- [A] SHARMA L ET AL: "INVESTIGATION INTO THE SURFACE RELIEF GRATING MECHANISM VIA XPS IN NEW AZOBENZENE BASED OPTICAL MATERIAL", POLYMERS FOR ADVANCED TECHNOLOGIES, JOHN WILEY AND SONS, CHICHESTER, GB, vol. 13, no. 6, June 2002 (2002-06-01), pages 481 - 486, XP001112859, ISSN: 1042-7147
- [A] DARRACQ B ET AL: "PHOTOINSCRIPTION OF SURFACE RELIEF GRATINGS ON AZO-HYBRID GELS", ADVANCED MATERIALS, VCH VERLAGSGESELLSCHAFT, WEINHEIM, DE, vol. 10, no. 14, 1 October 1998 (1998-10-01), pages 1133 - 1136, XP000781881, ISSN: 0935-9648

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