

<分子性物質を用いた固体機能性材料の応用例>

調査範囲; 高分子化合物も含め、明確な応用を意識した固体機能性材料の研究例を集めた。中でも今回は、導電性、光学的特性またはこれらの双方に注目した、電池、スイッチ、接合子、整流子や演算素子、エネルギー変換機といった機能を、分子間の電荷移動相互作用や異性化、二色性といった分子性物質固有の性質が、もしくは分子性物質が他に比べて優れていると思われる特性を生かした研究例を集めた。その多くは実際に応用の兆しが見えたという報告かもしくはそれに順ずると判断されたものであるが、それを支えるような「基礎的な」研究(例えば理論など)も重要だと判断し、あえて含めた。

(1) "On the characterization and gas sensing properties of Cu(II) tetra(alkylamino carbonyl) phthalocyanine LB films", S. Capone, R. Rella, P. Siciliano, L. Vasanelli, L. Valli, L. Troisi, Thin Solid Films, 327-329(1998), pp.465-468.

Langmuir-Blodgett Films; Substituted Phthalocyanine; Dynamic Response; Electrical response to NO₂ gas; Optical Characterization

(2) " Langmuir-Blodgett films of Cu(II) tetrakis(3,3-dimethylbutoxycarbonyl) phthalocyanine; a spectrophotometric and TEM analysis of their structure and morphology", D. Manno, R. Rella, L. Troisi, L. Valli, Thin Solid Films, 280(1996), pp.249-255.

Langmuir-Blodgett Films; Optical Spectroscopy, Structural Properties; Transmission Electron Microscopy

(3) "Ordered Langmuir-Blodgett multilayers of copper phthalocyanine derivatives", L. Valli, R. Rella, A. Tepore, A. Zocco, Materials science and Engineering C5(1998), 243-250.

Phthalocyanine Derivatives; Langmuir-Blodgett Multilayers; Transmission Electron Microscopy

(4) "EPR study of in-plane anisotropy in the LB films of a Cu(II) [tetra alkoxy carbonyl] phthalocyanine deposited on mylar sheets", L. Pasimeni, U. Segre, A. Toffoletti, L. Valli, A. Marigo, Thin Solid Films, 284-285(1996), pp.656-658.

Phthalocyanine; Langmuir-Blodgett Films; Electron Paramagnetic Resonance Spectroscopy; Surface Order

(5) "Characterization of novel copper phthalocyanine Langmuir-Blodgett films for NO₂ detection", R. Rella, A. Serra, P. Siciliano, A. Tepore, L. Troisi, L. Valli, Thin Solid Films, 284-285(1996), pp.870-872.

Langmuir-Blodgett Films; Copper Phthalocyanine; Anisotropy; Nitrogen Dioxide; Dynamic Response Characteristics of the Electrical conductance to different NO₂ concentrations

(6) "Effects of NO₂ oxidizing gas on a novel phthalocyanine Langmuir-Blodgett thin film", R. Rella, A. Serra, P. Siciliano, A. Tepore, L. Valli, A. Zocco, Thin Solid Films, 286 (1996), pp.256-258.

Nitrogen Dioxide; Oxidation; Langmuir-Blodgett Films; Organic Substances

(7) "Applications in gas-sensing devices of a new macrocyclic copper complex", R. Rella, A. Serra, P. Siciliano, A. Tepore, L. Valli, A. Zocco, Sensors and Actuators, B42(1997), pp.53-58.

Gas sensors; Phthalocyanine; Thin Films

(8) "Gas-sensing properties of multilayers of two new macrocyclic copper complexes", R. Rella, , P. Siciliano, D. Manno, A. Serra A. Taurino, A. Tepore, L. Valli, A. Zocco, *Sensors and Actuators*, B44(1997), pp.585-589.

Gas sensors; Phthalocyanine; Thin Films

(9) "Host-Guest Complexes of an Amphiphilic β -Cyclodextrin and Azobenzene Derivatives in Langmuir-Blodgett Films", M. Tanaka, Y. Ishizuka, M. Matsumoto, T. Nakamura, A. Yabe, H. Nakanishi, S. Tamura, W. Takagi, H. Nakahara, K. Fukuda, *Chem. Lett.*, pp.1307-1310(1987).

Langmuir-Blodgett Films, Host-Guest Complexes, Optical Memories

(1 0) "Optical absorption and luminescence in Langmuir films of merocyanine dye", *Thin Solid Films*, 132 (1985), pp.21-26.

Electronics and Optics; Optical Memory

(1 1) "Electrochemical polymerization in Langmuir-Blodgett film of new amphiphilic pyrrole derivatives", T. Iyoda, M. Ando, T. Kaneko, A. Ohtani, T. Shimidzu, K. Honda, *Tetrahedron Lett.*, 27(46), 5633-5636(1986).

Electrochemical Polymerization; Anisotropic Conductivity; Layered Structure

(1 2) "Possible applications for Langmuir-Blodgett films", M. C. Petty, *Thin Solid Films*, 210-211 (1992), pp.417-426.

Second-order Non-linear Optics, Gas Sensors, Ion Sensors, Bio-sensors, Molecular Recognition, Membranes, Electronic Devices; (a review with 156 refs)

(1 3) "Photochemical Switching in Conductive Langmuir-Blodgett Films", H. Tachibana, T. Nakamura, M. Matsumoto, H. Komizu, E. Manda, H. Niino, A. Yabe, Y. Kawabata, *J. Am. Chem. Soc.*, 111(1989), 3080-3081.

TCNQ Derivative; Azobenzene; Photoisomerization; Conductivity

(1 4) "A field effect transistor based on Langmuir-Blodgett films of an Ni(dmit)₂ charge-transfer complex", C. Pearson, A. J. Moore, J. E. Gibson, M. R. Bryce, M. C. Petty, *Thin Solid Films*, 244 (1994), pp.932-935.

Multilayer Structure; Thin Film Transistor; Capacitance

(1 5) "Electrically conductive Langmuir-Blodgett films of a charge-transfer materials", Martin R. Bryce, Michael C. Petty, *Nature*, 374(1995), 771-776.

Molecular Electronic Device; Field Effect Transistor;

(1 6) "A Molecular Shift Register Based on Electron Transfer", J. J. Hopfield, Jose Nelson Onuchic, David N. Beratan, *Science*, Vol.241, 817-820(1988).

(1 7) "Multi-mode Chemical Transducers. Part 2. Electrochromic and Photochromic

Properties of Azoquinone Compounds”, T. Saika, T. Iyoda, K. Honda, T. Shimidzu, J. Chem. Soc., Perkin Trans. 2, 1181-1186(1993).

(1 8) ”A Novel Type of Polymer Battery using a Polypyrrole-Polyanion Composite Anode”, T. Shimidzu, A. Ohtani, T. Iyoda, K. Honda, J. Chem. Soc., Chem. Commun., 327-328(1987).

(1 9) ”A Functionalized Polypyrrole Film Prepared by Chemical Polymerization at a Vapour-Liquid Interface”, T. Shimidzu, A. Ohtani, T. Iyoda, K. Honda, J. Chem. Soc., Chem. Commun., 1414-1415(1986).

(2 0) ”Effective Adsorption-Desorption of Cations on a Polypyrrole-Polymer Anion Composite Electrode”, T. Shimidzu, A. Ohtani, T. Iyoda, K. Honda, J. Chem. Soc., Chem. Commun., 1415-1416(1986).

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