

有機導体の応用データ集

北海道大学電子科学研究所 芥川 智行 (1999年度担当)

有機伝導体の応用として、(1) コンデンサー、(2) センサー・電極、(3) FET 素子に関して文献調査を行った。ポリマー・分子エレクトロニクスに関する調査は行っていない。

References

(1) コンデンサー関係

1. OSCON n-butyliisoquinoline(TCNQ)₂

<http://www.sanyo.co.jp/compo/os-con/>

「電解質に固体の有機半導体を用いたアルミ電解コンデンサで、一般的のアルミ電解コンデンサに比べ、約10倍の周波数帯域・数10分の1の低い内部抵抗を持つコンデンサで三洋電子部品の主力製品のひとつです。OSCONはその特性からパソコンを始め電話交換機やデジタルスチールカメラ等の電源回路に用いられているだけでなく、日本各地のオーディオファンの間で高性能・高音質の部品としても認知されています。最高位の「テクノロジー・オブ・ザ・イヤー賞」を受賞したJVC製のCDプレイヤー(XL-Z999EX)にはが大量に使用され音の演出に貢献しています。」

2. Development of new series of aluminum solid capacitors with organic semiconductive electrolyte (OS-CON). Niwa, S.; Taketani, Y. (Saga Sanyo Industry Co., Ltd., Omachi-cho, Saga 217, Japan). J. Power Sources, 60(2), 165-171 (1996)

2. "Electric properties of NMPTCNQ suspensions in a low dielectric permittivity plasticizer" Zhao, J., Buck, R.P., J. Electrochem. Soc. 137, 2431 (1990)

3. Conductivity and thermal properties of N-alkylated-heterocyclic compound-TDNQ complex salts and application to organic capacitor. Tsuchida, E.; Ohno, H.; Kobayashi, N., Electrochim. Acta, 32, 1197 (1987)

TCNQ系半導体の物質特許

4. N-Substituted isoquinolinium-TDNQ complexes as organic semiconductors. Tanaka, M.; Urano, F.; Nakahata, M.; Nagoya, M. Jpn. Kokai Tokkyo Koho JP 63233976 A2 29 Sep 1988 Showa, 6 pp. (Japan)

5. N-substituted alkylideneaminoguanidine derivative-TCNQ complexes as organic semiconductors and their preparation. Kurihara, H.; Shirai, K. (ELNA Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 63239263 A2 5 Oct 1988 Showa, 5 pp. (Japan)
6. Method of making organic semiconductive complexes of tetracyanoquinodimethane. Tanaka, M.; Urano, F.; Nakahata, M.; Nagoya, M. (Wako Pure Chemical Industries, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 62138462 A2 22 Jun 1987 Showa, 13 pp. (Japan)
7. Semiconductor device comprising an organic material., Eguchi, K.; Kawada, H.; Sakai, K.; Tomida, Y.; Matsuda, H.; Kimura, T.; Takimoto, K.; Miyazaki, T.; Morikawa, Y. (Canon K. K., Japan). Eur. Pat. Appl. EP 252756 A2 13 Jan 1988, 34 pp.
8. Organic semiconductive composition, Takahashi, S.; Yoshimura, S.; Kojima, Toshikuni; T., Soji; K., Yasuo (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 61163983 A2 24 Jul 1986 Showa, 4 pp. (Japan)
9. Organic semiconductor-impregnated electrolytic capacitor., Sugiura, T. (Hitachi Condenser Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 63239914 A2 5 Oct 1988 Showa, 3 pp. (Japan)
10. Organic semiconductor-impregnated electrolytic capacitor.
Sugiura, T. (Hitachi Condenser Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 63239916 A2 5 Oct 1988 Showa, 3 pp. (Japan)
11. Organic semiconductor-impregnated electrolytic capacitor. Sugiura, T. (Hitachi Condenser Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 63239915 A2 5 Oct 1988 Showa, 3 pp. (Japan)

(2) センサー・電極関係

1. Application of the organic conductor (fluoranthene)₂PF₆ as an ESR magnetic field probe, Dormann, E., Denninger, G., Sachs, G., Stocklein, W., Schwoerer, M. , J. Magn. & Magn. Mater., vol.54-57, 315 (1986)
2. Gaussmeter application of an organic conductor, Dormann, E., Sachs, G., Stocklein, W., Bail, B., Schwoerer, M., Appl. Phys. A, A30, 227 (1983)

3. Electrochemical immobilization of enzymes on conducting organic salt electrodes: characterization of an oxygen independent and interference-free glucose biosensor. Centonze, D.; Losito, I.; Malitestà, C.; Palmisano, F.; Zambonin, P. G. *J. Electroanal. Chem.*, 435, 103-111 (1997).
4. glucose biosensor, based on the electrochem. immobilization of glucose oxidase (GOD) in a poly(o-phenylenediamine) (PPD) film synthesized onto a NMP-TCNQ conducting org. salt (COS) electrode, is described and its performances are evaluated.
5. Bioelectrocatalysis at organic conducting salt electrodes. Use of hexamethylenetetratellurafulvalene tetracyanoquinodimethane (HMTTeF-TCNQ) as a versatile electrode material. Zhao, Shishan; Lennox, R. Bruce. *J. Electroanal. Chem.*, 346, 161-73 (1993).
6. Electropolymerization of pyrrole and phenylenediamine over an organic conducting salt based amperometric sensor of increased selectivity for glucose determination., Vidal, J. C.; Mendez, S.; Castillo, J. R. *Anal. Chim. Acta*, 385, 203 (1999).
7. Ultramicroelectrode array behavior of one-dimensional organic conductor electrodes. Freund, Michael S.; Brajter-Toth, Anna. *Anal. Chem.*, 61, 1048-52 (1989).
8. Electrochemistry of organic conducting salt electrodes: a unified mechanistic description. Zhao, Shishan; Korell, Ulrich; Cuccia, Louis; Lennox, R. Bruce. *J. Phys. Chem.*, 96, 5641 (1992).
9. Cyclic voltammetry and charge accumulation at conducting organic salt enzyme electrodes. Wilde, C. P.; Hu, A.; Rondeau, C. M.; Wood, M. *J. Electroanal. Chem.*, 353, 19 (1993).

(3) FET 素子

1. n-Channel organic transistor materials based on naphthalene frameworks., Laquindanum, Joyce G.; Katz, Howard E.; Dodabalapur, Ananth; Lovinger, Andrew J. *J. Am. Chem. Soc.*, 118, 11331-11332 (1996).
2. Thin-film organic channel field-effect transistor, Aguilhon, L.; Bourgoin, J. P.; Barraud, A.; Hesto, P. *Synth. Met.*, 71, 1971-4 (1995).