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Education

Ph. D. (March, 1979), M. Eng. (March, 1976), B. Eng. (March, 1974): Osaka University

Academic Carrier

1979 (April): Assistant Professor, Department of Petroleum Chemistry, Faculty of Engineering, Osaka University
1984 (July): Senior Lecturer, Department of Petroleum Chemistry, Faculty of Engineering, Osaka University
1988 (May)-1989 (March): Visiting Professor, Department of Chemistry, The University of Chicago (with Philip E. Eaton)
1992 (April): Associate Professor, Department of Chemistry, Faculty of Engineering Science, Osaka University
1998 (October)-: Professor, Division of Frontier Materials Science, Graduate School of Engineering, Osaka University
2003 (October)-2007 (August): Member of University Council, Osaka University
2007 (August)-2011 (August): Dean, Graduate School of Engineering Science, Osaka University

Awards and Honors

Chemical Society of Japan Award for Young Chemists (1986)

Research Interests

Physical Organic Chemistry: Synthesis and Properties of Structurally Novel Conjugated π-Systems, Two-Dimensional Self-Assembly on Surfaces

1. Tahara, K.; Yamaga, H.; Ghijens, E.; Inukai, K.; Adisoejoso, J.; Blunt, M. O.; De Feyter, S.; Tobe, Y. Control and Induction of Surface-Confined Homochiral Porous Molecular Networks. *Nat. Chem.* **2011**, *3,* 714-719.
2. Shimizu, A.; Tobe, Y. Indeno[2,1-*a*]fluorene: An Air-Stable *o*-Quinodimethane Derivative. *Angew. Chem. Int. Ed.* **2011**, *50*, 6906–6910.
3. Tahara, K.; Furukawa, S.; Uji-i, H.; Uchino, T.; Ichikawa, T.; Zhang, J.; Mamdouh, W.; Sonoda, M.; De Schryver, F. C.; De Feyter, S.; Tobe, Y. Two-Dimensional Porous Molecular Networks of Dehydrobenzo[12]annulene Derivatives via Alkyl Chain Interdigitation. *J. Am. Chem. Soc.* **2006**, *128*, 16613-16625.
4. Tobe, Y.; Utsumi, N.; Kawabata, K.; Nagano, A.; Adachi, K.; Araki, S.; Sonoda, M.; Hirose, K.; Naemura, K. *meta*-Diethynylbenzene Macrocycles: Syntheses and Self-Association Behavior in Solution. *J. Am. Chem. Soc.* **2002**, *124*, 5350-5364.
5. Tobe, Y.; Nakagawa, N.; Naemura, K.; Wakabayashi, T.; Shida, T.; Achiba, Y. [16.16.16](1,3,5)Cyclophanetetracosayne ($C_{60}H_6$): A Precursor to C_{60} Fullerene. *J. Am. Chem. Soc.* **1998**, *120*, 4544-4545.

Two-Dimensional Porous Molecular Networks Formed by Self-Assembly via van der Waals Interactions

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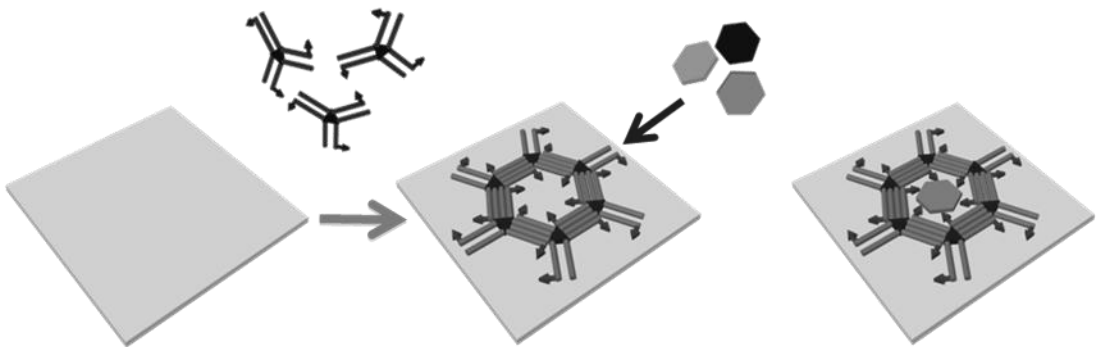
Creation of two-dimensional (2D) architectures, particularly those containing porous networks, on solid surfaces based on molecular self-assembly has received a great deal of interest in view of the prospective applications in the field of nanoscience/nanotechnology and catalysis, because of the possible surface patterning in a low nanometer regime. We found porous two-dimensional molecular networks were formed at liquid-solid interfaces (typically an organic solvent/graphite) from triangle-shaped phenylene-ethynylene macrpcycles, called dehydrobenzo[12]annulenes (DBAs), by their self-assembly via van der Waals interactions between the interdigitated alkyl groups. Factors that lead to the preferential formation of porous, honeycomb-shaped networks were elucidated including alkyl chain length, solvent, concentration, and solid substrates.[1] Two-dimensional homochirality was induced by addition of a small amount of specifically designed *chiral* DBA into an *achiral* DBA via hierarchical recognition.[2] Co-adsorption of *guest* molecules in the pores occurred reflecting their size and shapes, leading to not only co-adsorption of homo-molecular as well as hetero-molecular clusters but also a superstructure with a long range order.[3] Moreover, the interior of the pores can be functionalized for molecular recognition events as shown below.



(1) Tahara, K.; Furukawa, S.; Uji-i, H.; Uchino, T.; Ichikawa, T.; Zhang, J.; Mamdouh, W.; Sonoda, M.; De Schryver, F. C.; De Feyter, S.; Tobe, Y. *J. Am. Chem. Soc.* **2006**, *128*, 16613–16625; Lei, S.; Tahara, K.; De Schryver, F. C.; Van der Auweraer, M.; Tobe, Y.; De Feyter, S. *Angew. Chem. Int. Ed.* **2008**, *47*, 2964–2968; Tahara, K.; Okuhata, S.; Adisoejoso, J.; Lei, S.; Fujita, T.; De Feyter, S.; Tobe, Y. *J. Am. Chem. Soc.* **2009**, *131*, 17583–175907.

(2) Tahara, K.; Yamaga, H.; Ghijens, E.; Inukai, K.; Adisoejoso, J.; Blunt, M. O.; De Feyter, S.; Tobe, Y. *Nat. Chem.* **2011**, *3*, 714–719.

(3) Furukawa, S.: Tahara, K.; De Schryver, F. C.: Tobe, Y.; De Feyter, S. *Angew. Chem. Int. Ed.* **2007**, *46*, 2831–2834; Lei, S.; Tahara, K.; Feng, X.; Furukawa, S.; De Schryver, F. C.; Müllen, K.; Tobe, Y.; De Feyter, S. *J. Am. Chem. Soc.* **2008**, *130*, 7719–7729; Lei, S.; Surin, M.; Tahara, K.; Adisoejoso, J.; Lassaroni, R.; Tobe, Y.; De Feyter, S. *Nano Lett.* **2008**, *8*, 2541–2546; Adisoejoso, J.; Tahara, K.; Okuhata, S.; Lei, S.; Tobe, Y.; De Feyter, S. *Angew. Chem. Int. Ed.* **2009**, *48*, 7553–7556