Dept. of Chemistry and Biochemistry: 2019 Boekelheide Lecturer

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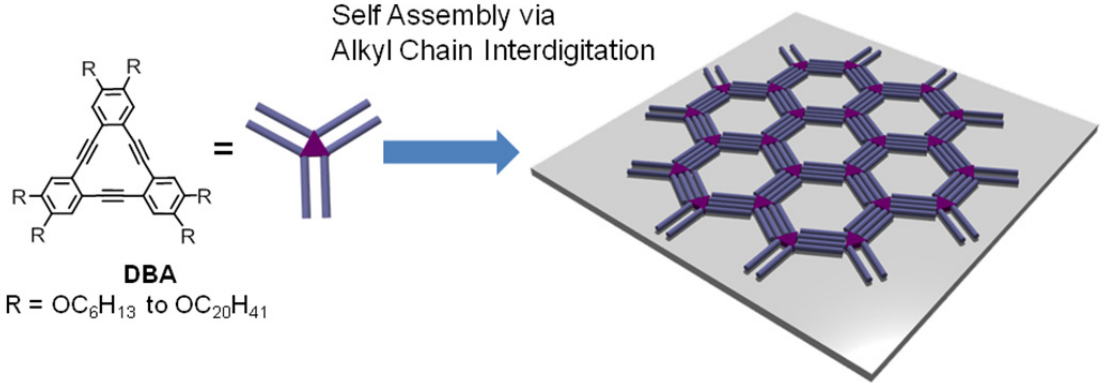
# Porous Self-Assembled Monolayers at Solution/Graphite Interfaces: From On-Surface Chirality to Molecular Lithography

Friday, May 17, 2019
331 Klamath
2:00 pm reception
2:30 pm Seminar

Porous monolayers formed by molecular self-assembly on surfaces have attracted a great deal of interest ranging from potential applications to tailor-made catalysis and molecular electronics to fundamental principle of crystallization. For more than a decade,[1] we have studied by scanning tunneling microscopy (STM) on-surface self-assembly at the liquid/solid interface of alkoxy-substituted dehydro[12]annulenes (DBAs), which form porous monolayers via van der Waals linkages between the interdigitated alkyl chains. DBAs exhibit remarkable adaptability thank to their versatility in synthetic modifications. These include (i) pore size control by changing the alkoxy chain length, (ii) parity effect by using even or odd number alkoxy chains, (iii) generation and reversion of supramolecular chirality on surfaces by introducing stereocenters into the alkoxy chains, (iv) chemical modification of the pore interior for selective co-adsorption of guest molecules, (v) stereo-controlled epitaxial multilayer formation, and (vi) use as templates for chemical modification of surfaces. After general introduction, the lecture will focus on the on-surface chirality[2-4] and periodical surface modification using the networks as removable masks, i.e., molecular lithography.[5]




**References:**

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3. Fang, Y.; Ghijsens, E.; Ivasenko, O.; Cao, H.; Noguchi, A.; Mali, K. S.; Tahara, K.; Tobe, Y.; De Feyter, S. *Nat. Chem.* **2016**, *8*, 711.
4. Tahara, K.; Noguchi, A.; Nakayama R.; Ghijsens, E.; De Feyter, S.; Tobe, Y. *Angew. Chem. Int. Ed.* **2019**, *58*, in press.
5. Tahara, K.; Ishikawa, T.; Hirsch, B. E.; Kubo, Y.; Brown, A.; Eyley, S.; Daukiya, L.; Thielemans, W.; Li, Z.; Walke, P.; Hirose, S.; Hashimoto, S.; De Feyter, S.; Tobe, Y. *ACS Nano*, **2018**, *12*, 11520.