

TRIPOD-SHAPED PENTA (*P*-PHENYLENE)S FOR THE FUNCTIONALIZATION OF SILICON SURFACES

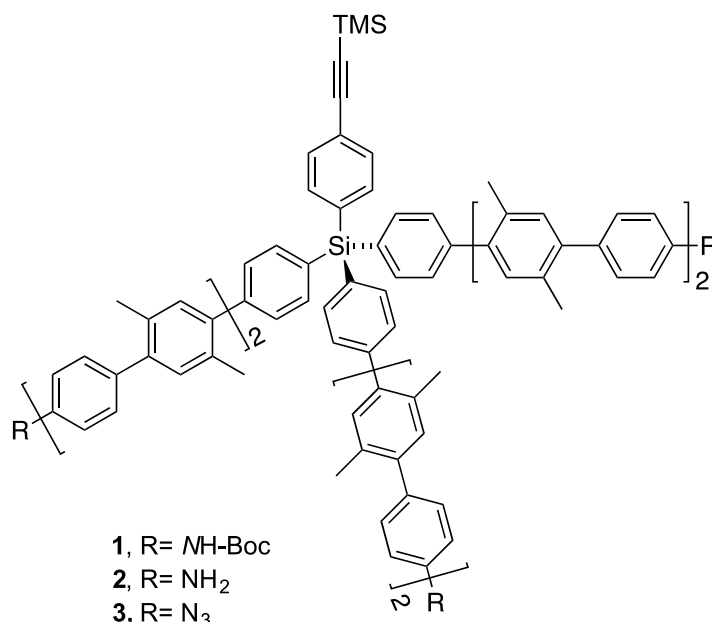
María Sánchez-Molina, Rafael Contreras-Cáceres, Amelia Díaz, María Valpuesta and Juan M. López-Romero

Department of Organic Chemistry, Faculty of Science, University of Málaga, Campus de Teatinos s/n, 29071 Málaga, Spain

In order to obtain nanostructured thin films to be used in biosensor devices, several chemical functionalization methods have been developed, such as Click chemistry or Suzuki carbon-carbon coupling reactions on surfaces.¹

With the aim to control the orientation and spacing between grafted functional groups on a surface, tripodal oligo (*p*-phenylene)s have become the ideal anisotropic adsorbates due to their shape-persistent and self-standing characteristics.²

Here we report the synthesis and characterization of several tripod-shaped oligo(*p*-phenylene)s molecules with legs composed of five phenylene units, compounds **1**, **2** and **3**. In these structures, each leg is end-capped with an *NH*-Boc, NH_2 and N_3 group, respectively. The functional arm contains an acetylene group. The presented synthesis has as key step the Pd-catalyzed Suzuki cross-coupling reaction. In particular, a iodine derivative from the silicon core molecule reacts with the appropriate tetra(*p*-phenylene) boron derivative, thus generating the final tripod-shaped structure. The azide end-capped leg in **3** is specifically designed for its covalent incorporation on alkynyl terminated silicon surfaces by an easy and reproducible way. As a preliminary study, we present the alkynyl-functionalized silicon wafers nanostructuration with tripod **3** through the copper catalyzed alkyne-azide cycloaddition (CuAAC) click reaction.



[1] Wong, L. S.; Khan, F.; Micklefield, J. *Chem. Rev.*, **2009**, *109*, 4025-4053.

[2] López-Tocón, I.; Peláez, D.; Soto, J.; Rico, R.; Cai, C.; López-Romero, J. M.; Otero, J. C., *J. Phys. Chem. B* **2008**, *112*, 5363-5367