

An STM study on the formation of mixed alkylethers on HOPG

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The structural changes as a function of the mixture ratio of self-assembled monolayers (SAMs) of two phenyl alkylethers at room temperature have been investigated by scanning tunneling microscopy (STM). Mixed SAMs of iodo-phenyl octadecyl ether (I-POE) and iodo-phenyl docosyl ether (I-PDE), which contain a phenyl ring (head) and long alkyl chain (tail) were synthesized using a modified Williamson ether synthesis. 3.0 wt% mixed solutions of I-POE and I-PDE in phenylhexane were prepared. A drop of the mixed solution was spread onto highly oriented pyrolytic graphite (HOPG). STM images of mixed SAMs of I-POE and I-PDE formed at pure I-POE SAMs formed and mixed I-POE/I-PDE SAMs will be presented. Mixed SAMs of I-POE/I-PDE are 1.12:1 and 1:1 with the ratio of pure I-POE to mixed I-POE/I-PDE to be 8:2 and 6.5:3.5. And mixed SAMs of I-POE/I-PDE are 1:2 with only mixed I-POE/I-PDE SAMs. STM images of pure alkylethers revealed the head-tail configuration. In case of mixed SAMs we could observe separated domain of each molecule instead of molecularly mixing state.