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Introduction

Several types of self assembled monolayers (SAMs) derived from bidentate adsorbates have been studied on Au(111) surfaces. Films generated from bidentate adsorbates typically have a chain packing density that is lower than those from alkanethiol adsorbates. To address this issue, a new form of olefin-bridged bidentate adsorbate was synthesized. By implementing a double bond into the structure of the adsorbate we, aim to mimic the chain packing density of an alkanethiol film.



Densely packed thin films



Loosely packed thin films

## **Objectives**

Olefin-bridged bidentate adsorbates were designed with increasing alkyl chain lengths, OBC-15 and **OBC-16**. The bidentate adsorbates were prepared in different solvents (EtOH, DMSO, DMF, isooctane, and THF) to find optimal film developing conditions. The SAMs derived form the bidentate adsorbates were compared to SAMs derived from analogous monothiol adsorbates.











## Synthesis and Study of Symmetric Olefin-Bridged Bidentate Adsorbates and their Monolayers on Gold

$\bigwedge$	Condition	Packing Density
	C15SH	100%
	OBC15-SH (1 mM) in EtOH	88%
	OBC15-SH (1 mM) in DMSO*	
	OBC15-SH (1 mM) in DMF	74%
	OBC15-SH (1 mM) in isooctane	55%
65 160	OBC15-SH (1 mM) in THF	32%

$\bigwedge$	Condition	Packing Density
/ h	C16SH	100%
	OBC16-SH (1 mM) in EtOH	91%
$\sim$	OBC16-SH (1 mM) in DMSO*	
$\bigwedge$	OBC16-SH (1 mM) in DMF	71%
$\sum_{i=1}^{n}$	OBC16-SH (1 mM) in isooctane	56%
	OBC16-SH (1 mM) in THF	30%



suggest a possible odd even effect.

### Conclusions

Symmetrical olefin-bridged bidentate adsorbates (OBS15-SH and OBC16-SH) were successfully synthesized. Overall, the films developed in EtOH yielded films with similar packing densities and conformational order as their monodentate SAMs of equivalent chain length. Water contact angles of the bidentate films revealed similar wetting behavior as the monodentate SAMs. However, with the nonpolar hexadecane, the bidentate SAMs were more wettable. Interestingly, there appears to be an odd-even effect in the wettability of the SAMs generated from OBC15-SH and OBC16-SH. To confirm this phenomenon, **OBC17-SH** and **OBC18-SH** will be synthesized and their SAMs analyzed.

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