SJSU | DEPARTMENT OF CHEMISTRY

CHEMISTRY Departmental Seminar

Spring 2019
CHEM 285/191 Schedule
Tuesday at 4:30-5:45PM
Room Duncan Hall 250

April 9th, 2019

Mr. Alexis Sarabia
SJSU Simocko Lab
MS Final Oral Seminar

Understanding Polymer Brush Thermal Stability

Nanostructures, features that are generated on the scale of 1-100nm, have potential in many applications including optoelectronics, drug delivery vesicles, and sensors.[1] Mixed polymer brushes, polymer brushes composed of two or more unique polymer types, have been shown to give rise to distinct nanostructures by tuning the ratios of the polymers.[2] Polymer brushes, polymers that are covalently tethered to a solid surface, are mechanically and chemically robust, but their thermal stability is not well understood.[3,4]

Because many potential applications involving polymer brushes require elevated temperatures, understanding and tuning the thermal stability of polymer brushes is important.[5] We are studying the thermal properties of homo, binary, and ternary polymer brushes consisting of polystyrene, poly(methyl methacrylate), poly(4-vinyl pyridine), and poly(2-vinyl pyridine). The polymer brushes are synthesized using free radical polymerization and the thickness of the brushes is measured with spectral reflectance (SR). By examining brush density, brush thickness, and polymer identity we have a better understanding of what dictates thermal stability: the number of unique polymers in a polymer brush or the polymer identity.

References

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4. Edmondson, S.; Osborne, V.L.; Huck, W. *Chem. Soc. Rev.* **2004**, 33, 14-22
5. Kang, H.; An, S.; Lee, W. J.; Kang, G. R.; Kim, S.; Hur, S.; Paeng, K.; Kim, M. ***RSC Adv.*** **2018**, **8**, 24166-24174

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