Abstract Submitted
for the TSS18 Meeting of
The American Physical Society

Investigation of the Interaction of Pyridine Complexes and MoS_2 Nanoflakes via Raman Spectroscopy ZACHARY LIEGE, WEIGANG LU, HOWARD HO WAI LEE, Baylor University, ALEXEI SOKOLOV, Texas AM University, ZHENRONG ZHANG, Baylor University — Monitoring chemical reactions in real time has applications ranging from basic chemical analysis of intermediates to catalysis to biochemistry. Raman spectroscopy is a highly selective sensing technique that can give detailed chemical information about an analyte in real time. In this work, we investigate the chemical activity of MoS_2 nanoflakes using Raman spectroscopy. Pyridine is used as a Raman probe due to its well-known vibrational spectrum. When mixed with ethanol or water, pyridine forms complexes via hydrogen bonding that shift the Raman peaks in a quantifiable manner. By mixing these complexes with prepared solutions of MoS_2 nanoflakes, the effect of the nanoparticles on the interaction of pyridine and its solvent can be measured. Peak ratio analysis indicates that smaller flakes seem to "accelerate" the interaction, creating larger peak shifts at much lower concentrations of nanoflakes. This is likely due to the increased ratio of edge sites to surface area of the flakes.

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Date submitted: 09 Mar 2018 Electronic form version 1.4