

Homework #1

Chem 475

1. If you have a self assembled monolayer of 1-docosane thiol on gold that is analyzed by (a) XPS and (b) EDX. What is the difference of the relative ratio of Au:S:C going to be?
2. Burning 1.0000 g of a hydrocarbon in a combustion analysis apparatus gives 1.3620 g of H₂O and 3.1053 g of CO₂. The boiling point was found to be 252-254 °C. What is it? Show your calculations.
3. A sample of mineral nanoparticles is analyzed by AA or ICP-AES. The results indicate that it contains 5.69% Ca and 51.11% Al. What is the mineral formula? What have you assumed that it contains? Is this a reasonable assumption? Why? What is the common name for the mineral and why was it called that?