

Asesor: Dr. Elder de la Rosa Cruz

Sinodales: Dr. Jesús González Hernández
(Sinodal Externo – CIDESI, Secretario)

Dr. Claudio Frausto Reyes
(Sinodal Interno, Vocal)

Dr. Elder de la Rosa Cruz
(Asesor de Tesis, Presidente)

Tesis: **“SERS SUBSTRATES WITH GOLD NANOPARTICLES FUNCTIONALIZED TO DETECT SPECIFIC ANALYTES”**

Resumen:

Raman spectroscopy is a valuable tool to get information of materials but has some problems when the quantity of sample is a few molecules. For sensing this quantity some techniques as SERS substrates are needed. SERS substrates implied characteristics of nanoparticles as geometry, the absorption of light related with surface plasmon and the spatial distribution. This thesis presents results of the Surface Enhanced Raman Scattering (SERS) substrates elaborated using gold nanoparticles with star shape for sensing random analytes and specific analytes. The substrates were divided on non specific analytes and specific analytes. SERS substrates for not specific analytes were tested with different size molecules and studied by the comparison of the enhancement factor by the length of the molecules. SERS specific substrates were prepared for sensing glucose. Glucose was chosen for the relevant implications that have this molecule in health social problems. Not specific SERS substrates achieves the enhancement factors up to 10^{12} and zeptomole detection of analytes. Selective SERS substrates conjugated by albumin achieves enhancement factors up to 10^7 and nanomole detection of glucose.