Compton Suppressor Systems for Neutron Activation Analysis

I have completed a training course in Compton Suppressor Systems for Neutron Activation Analysis. I acquired skills and abilities concerning the quantitative determination of short, medium and long-lived radionuclides in irradiated biological samples. Such techniques are employed in numerous fields, including geology, archaeology, biology, soil science, forensics, and in the semiconductor industry. However, one issue with this technique stems from the emission of low energy gamma radiation by these radionuclides, impairing proper measurement of emitted radiation. This is known as the Compton effect.

To solve this problem, there are currently teams measuring gamma radiation and using certain devices and mathematical models to mitigate the Compton effect, which are called Compton Suppressor Systems (CSS). The training consisted of the following:

- **Gamma Ray Spectrometry Course.** This course taught me about the design detectors used to quantify gamma radiation and about how neutrons damage these detectors. I learned to calculate the energies corresponding to the Compton edge and backscatter peak as well as the rates for gross, background and net counting.

- **Understanding the Configuration and Optimization of Compton Suppression Systems used at the University of Texas, NETL.** The literature review regarding the Compton Suppressor System instructed me in the configuration of these systems to gradually reduce the Compton continuum. I was taught about the the properties of reactions that produce radionuclides of varying lifespans.

- **Characterization of Compton Suppressor System. I** learned to characterize Compton Suppressor Systems by calculating the Peak-to-Compton Ratio.

- **Quantitative Determination of Short, Medium and Long-Lived Radionuclides in Irradiated Biological Samples.** I learned to identify said radionuclides in radioactive biological samples and to calculate concentrations depending on detection limits.