Currently, thin film solar cell technologies lack the competitive efficiency required for commercial production. While these types of solar cells are not very efficient, they have benefits such as being made of earth abundant and benign materials. Copper, zinc, tin, sulfide (CZTS) and copper, zinc, tin, selenide (CZTSe) solar cells are thin film solar cell technologies made from earth abundant and benign materials. CZTS cells were made using a stacked evaporation process on a layer of molybdenum coated glass. The evaporation process was run in a uniquely designed evaporator. Then the CZTS layer was annealed in a sulfur or selenium environment. Layers of cadmium sulfide (CdS) and indium tin oxide (ITO) were deposited on top of the CZTS layer. To complete the cell, aluminum top contacts were deposited on top of the ITO layer. The CZTS layer was analyzed using scanning electron microscopy, energy dispersive x-ray spectroscopy, x-ray diffraction, and atomic force microscopy. The ITO layer was analyzed using a profilometer, 4-point probe, and UV/VIS.