**Phosphorescence in Dysprosium Doped Semiconductors**

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The objective of our research was to produce long lasting phosphorescence effects in semiconductor. Typically, these effects can be produced in semiconductors that are doped with europium and last for hours after charging due to exposure in visible light spectra. However, our research entirely eliminated the use of europium for phosphorescence effects in the semiconductor. We used dysprosium as a doping substitute in strontium, calcium and barium compounds. Samples were heated at 1000°C for three days to purify the substance and then placed in the Scanning Electron Microscope for examination for molecular structure and composition. During these examinations, it is noted that frequent displays of luminescence were observed yet there were no notable lasting phosphorescent effects. This process was also repeated for the inclusion of nickel oxide in these compounds. X-ray diffraction was briefly used to verify and determine the crystalline structure and composition of the produced compounds. Lastly, binary phase diagrams of the original strontium, calcium and barium compounds and the nickel oxide doped compounds were produced to determine the melting points of the different compositions of the two phases. Future endeavors for experimentation on this project would include checking the composition of luminescent areas in the compound with the use of the probe and reproducing new compounds based on the composition of these areas in order to produce phosphorescence in the dysprosium doped compound, testing phosphorescent effects in Cadmium doped compounds, the creation of completed binary phase diagrams of the two original phases, and the creation of tertiary phase diagrams with the new cadmium doped phase.