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CdSe-ZnS Core-Shell and Gold Quantum Dots and the Effects of Different Substrates GILBERT BUSTAMANTE, SPS, MOHSEN PURAHMAD, RADE KULJIC, MITRA DUTTA — Over the past 20 years, all areas of nanotechnology have been advancing, whether in basic understanding of their complexity or their use in various applications. Quantum dots, nanowires, and nanoparticles are just a few nanostructures used for a wide variety of applications, ranging from electronics, optoelectronics, to diverse biomedical uses. Due to the size of these particles and devices scaling down, we can no longer use classical physics to determine their behavior rather we need to use quantum mechanics. The goal now is to understand these nanostructures in order to use them effectively. Our objective for this project was to view the properties and formations of the layer of Cadmium Selenide, Zinc Sulfide (CdSe-ZnS) core-shell quantum dots when placed on different substrates, Glass, Indium Tin Oxide (ITO), Silicon (Si), and Gallium Arsenide (GaAs) and how Gold quantum dots reacted to substrates at different temperature differences. The CdSe-ZnS quantum dots were prepared in water then dropped cast onto each of the four substrates. Once the solution evaporated, we used Photoluminescence and UV-Vis Absorption Spectroscopy, along with viewing the substrates under a microscope, to investigate if the properties of the quantum dots were different and if the quantum dots formed any particular patterns. The results of the measurements show that the substrates have no significant effects on the quantum dots' properties but the formation of the quantum dots were different.

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