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Green Chemistry Techniques for Gold Nanoparticles Synthesis
SARAH A. CANNAVINO, CHRISTY A. KING, DAVON W. FERRARA, Belmont University — Gold nanoparticles (AuNPs) are often utilized in many technological and research applications ranging from the detection of tumors, molecular and biological sensors, and as nanoantennas to probe physical processes. As these applications move from the research laboratory to industrial settings, there is a need to develop efficient and sustainable synthesis techniques. Recent research has shown that several food products and beverages containing polyphenols, a common antioxidant, can be used as reducing agents in the synthesis of AuNPs in solution. In this study, we explore a variety of products to determine which allow for the most reproducible solution of nanoparticles based on the size and shapes of particles present. We analyzed the AuNPs solutions using extinction spectroscopy and atomic force microscopy. We also develop a laboratory activity to introduce introductory chemistry and physics students to AuNP synthesis techniques and analysis.

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