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Green Synthesis and Evaluation of Catalytic Activity of Mono, Di and Trisaccharide Capped Gold Nanoparticles YOGESH KHERDE, Western Kentucky University, FENIL CHAVDA, The Carol Martin Gatton Academy, Western Kentucky University, JASON PAYNE, RAJALINGAM DAKSHINAMURTHY, Western Kentucky University — Gold nanoparticles have gained a lot of interest due to their wide applications in the field of biomedical and pharmaceutical. The applications of nanoparticles are due to their unique properties when they are reduced to their nanoscale size range. We present a novel single step biofriendly process for synthesis of Fructose (monosaccharide), Sucrose (disaccharide) and Raffinose (trisaccharide) capped gold nanoparticles, where in sugar is directly capped onto gold without the use of any secondary capping/stabilizing agent. Our study was mainly focused on the effect of different lengths of sugars on the formation and catalytic activity of sugar capped GNPs. Characterization of nanoparticles is done by using various analytical techniques such as transmission electron microscope, FTIR, UV-Vis spectroscopy and SEM-EDS. We evaluated the catalytic activity of sugar capped GNPs by using nitrophenol reduction assay at different temperature. From the average reaction rate constants at three different temperatures we determined the activation energy. The kinetic data indicates that fructose GNPs have the highest catalytic activity, while raffinose shows the lowest catalytic activity. This difference in the catalytic activity may be attributed to the size of ligand on gold surface which affects the surface to volume ratio.

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