**Abstract**

Among the metal nanoparticle series of family, silver nanoparticles can have great impact for wide range of applications due to their interesting tunable physical and chemical properties. In this present work, silver nanoparticles are prepared using chemical reduction method with hydrazine hydrate and polyvinylpyrrolidone used as reducing and stabilizing agent. Systematic investigation is carried out by changing AgNO3, hydrazine hydrate and polyvinylpyrrolidone concentration for synthesis of the size controlled formation stable silver nanoparticles. The formed silver nanoparticle are subjected for UV-VIS, XRD AND FE-SEM analysis. The result of the formation of stable silver nanoparticle differentiated with tunable different textured colors of silver nanoparticles. The characterization results are clearly established the fact of formation of good quality with high crystallinity of silver nanoparticles. The antibacterial activity against *Escherichia coli* and *Staphylococcus aureus* are performed using well diffusion method and their zone of inhibition is discussed.