

Biosynthesis of silver nanoparticles using Thyme Vulgaris leaves extract and its Antibacterial activity

Jomana Maher Rakaa, Ahmed S. Obaid

Department of Physics, College of Science, University of Anbar

Keywords:

Silver nanoparticle , Thyme , FESEM , Antibacterial activity, Escherichia coli, Staphylococcus aureus

Abstract:

In the current research, an eco-biosynthesis method for synthesizing silver nanoparticles (AgNPs) is reported using thymus vulgaris leaves (*T. vulgaris*) extracts. The optical and structural properties of the nanoparticles is determined using UV-visible, x-ray diffraction (XRD) and field emission scanning electron microscope (FESEM). In addition, the synthesis factors such as the temperature, the molar ratio of silver nitrate and thymus vulgaris leaves extract have been investigated. The XRD pattern presented higher intensity for the five characteristic peaks of silver. FESEM images for some samples indicated that the particle size was distributed between 24-56 nm. In addition, it's observed the formation of some aggregated Ag particles which is expected due to the precipitation effect. The mixtures were used to inhibit two kinds of bacteria which are Escherichia coli and Staphylococcus aureus by tested for antibacterial activity by agar well diffusion method. The results show the effectiveness of the synthesized AgNPs on inhibition the growing up of the bacteria and their isolates. Where the AgNPs which synthesised with volumetric ratio of 1:10 show a higher inhibition efficiency for different concentration of the bacteria under the investigating.