

TEM Study of Anti-Microbial Activity of Silver Nano-Particles Using Ultrasonic Irradiation Method

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Silver particles or silver ions in solution have been well as strong inhibitory and bactericidal effect as well as a broad spectrum of anti-microbial activities from long time ago. In this study, we specially focused on the effect of anti-microbial and minimum inhibitory concentration (MIC) for the *Staphylococcus aureus* KCTC 1928 (*S. aureus*) and *Escherichia coli* KCTC 10411 (*E. coli*) with Ag nanoparticles (Ag-NPs) aqueous solution. From the results of anti-microbial effect of Ag-NPs for *S. aureus* and *E. coli*, we investigated using cup diffusion method. And for investigating anti-microbial activity for *S. aureus* and *E. coli*, we prepared Ag-AgNPs and Pt-NPs solution stabilized with PVP (poly vinyl pyrrolidone) and SDS (sodium dodecyl sulfate). We also speculated these antibacterial activities and their behavior at real situation samples by TEM and SEM etc. From those results, the surface of *S. aureus* and *E. coli* treated with Ag-NPs were definitely destroyed compared to the non treated control group. We could conclude that the Ag-NPs treatment caused the disruption of the cell walls and Ag-NPs have an antibacterial action *S. aureus* and *E. coli* by disrupting cells. We also examine with Ag-NPs treatment based on ultrasonic irradiation method for antibacterial activities at various food and cosmetics application fields.