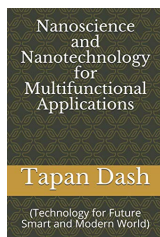


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**Application of Ultrasound for the Synthesis of Metal Oxide Nanomaterials with Novel Morphology****Dojalisa Sahu**

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**Abstract**

In this chapter, sonochemical method of synthesis of nanomaterials such as; metal oxide nanoparticles has been discussed. The basic principles of sonochemistry such as cavitation and bubble formation have been explained. Effect of ultrasound on growth of nanoparticles has been studied and the detailed mechanism has been given. Metal oxide nanomaterial like ZnO is very versatile and carries novel properties. The nanomaterials properties largely depend upon the size/shape/morphology of it. So, effect of ultrasound application on growth and morphology of pristine ZnO along with Cu, Ag and Au doped ZnO have been studied and discussed. It has been observed that application of ultrasound method is found to be effective to synthesize novel functional materials with various morphology and size in nanometer regime. Acoustic cavitation is the phenomenon from which the chemical effects of ultrasound irradiation arise. This process further leads to secondary processes like formation, growth and sudden collapse of bubbles in the solution. High range of temperature along with pressure occurs during this method in the medium. The above conditions are achieved during the phenomenon of acoustic cavitation which leads unique properties in the irradiated solution. The detailed principle, process parameter and morphology of nanomaterials after ultrasound application have been discussed.

**Keywords:** Metal oxide, Nanoparticles, Sonochemical Method, Cavitation, Ultrasound