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Chapter-2

Synthesis routes to Silver Nanomaterials

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2.1 Introduction

Growing demand for AgNPs in different fields, such as optical, catalytical, cosmetic, chemical industries, food and feed, biomedical sciences and energy sciences, is mainly depend upon the perfect morphology of the nanoparticles. So it is very important to synthesis of AgNPs in perfect shape and size. The size and shape of the AgNPs depends upon the various synthetic routes. The AgNPs can be synthesized primarily by two approaches i. e., top-down approaches bottom-up approaches.[1] In top-down method deals with the synthesis of AgNPs directly from bulk material by using different physical and mechanical methods. In this methods AgNPs are produced in between 10 to 100 nm. But in case of bottom-up approaches it starts from individual atoms to complex cluster of different shape and size by using of chemical method, biological method and microwave approach.[2] The different approaches of synthesis are given in figure 1.

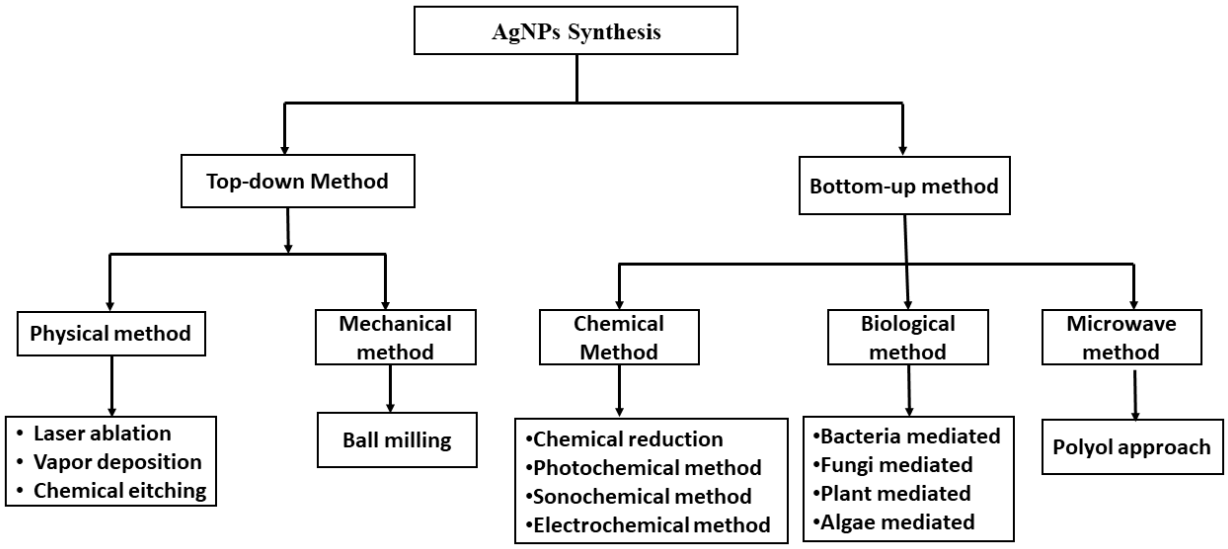

Figure 1: Schematic diagram for synthesis of silver nanoparticles.

2.2 Top-down method:

Top-down method is used for synthesis of nanomaterials by breaking down the bulk materials by using different physical forces, such as crushing or grinding, ball milling, thermal energy,