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Metal Nanoparticles in Pharma

 Springer

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Chapter 17

Nanometals in Bhasma: Ayurvedic Medicine

Dilipkumar Pal and Vinod Kumar Gurjar

Abstract Bhasmas are unique Ayurvedic metallic preparations with herbal juices or fruits, known in the Indian subcontinent since the seventh century BC and widely recommended for treatment of a variety of chronic ailments. More than 18 Bhasmas based on calcium, iron, zinc, mercury, silver, potassium, arsenic, copper, tin, and gemstones were analyzed for up to 18 elements by instrumental neutron activation analysis method, including their C, H, N, and S contents. In addition to the major constituent elements found at percent level, several other essential elements such as Na, K, Ca, Mg, V, Mn, Fe, Cu, and Zn have also been found in $\mu\text{g/g}$ amounts and ultratrace (ng/g) amounts of Au and Co. The Bhasmas are biologically produced nanoparticles and are taken along with milk, butter, honey, or ghee thus; this makes these elements easily assimilable, eliminating their harmful effects and enhancing their biocompatibility. Particle size (1–2 μm) is reduced significantly, which may assist absorption and assimilation of the drug into the body system. Standardization of *Bhasma* is utmost necessary to confirm its identity and to determine its quality, purity safety, effectiveness, and suitability of the product. But the most important challenges faced by these formulations are the lack of complete standardization by physiochemical parameters.

Keywords Ayurveda • *Bhasma* • Nanoparticle • Nanotechnology • *Lauha Bhasma* • *Shankha Bhasma* • Nanomedicine

Abbreviations

AFM	Atomic Force Microscopy
Ag	Silver
Au	Gold
CaO	Calcium Oxide

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