

Conference presentation

Multicenter project Brazil-Italy: physicochemical analysis of *Zincum metallicum* and lactose in dynamized mixtures

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Abstract

Background: The use of sensitive techniques can be useful to increase the understanding of homeopathic systems behavior.



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Aim: To analyze physicochemical properties of *Zincum metallicum* and lactose mixtures prepared according to Brazilian Homeopathic Pharmacopeia.

Methodology: *Zincum metallicum* was prepared using lactose as vehicle, from 1 to 3 cH, and from 1 to 6dH. All samples including respective controls (dynamized lactose) were analyzed by Atomic Absorption Spectroscopy (AAS), X-ray Diffraction (XRD), Transmission Electron Microscopy (TEM) with X-Ray Energy Dispersive Spectroscopy (EDX), Scanning Electron Microscopy (SEM), and Differential Scanning Calorimetry (DSC).

Results: AAS analysis showed the dynamization process decreases zinc concentration in a proportional manner to the increase of homeopathic potencies. Quantities of 4ppm and 132 ppm of zinc were detected in 6dH and 3cH, respectively. XRD analysis showed crystalline form of lactose was not modified by dynamization. Amorphous lactose spheres were observed by TEM in all samples, with mean size ranging from 800 to 200 nm. EDX obtained in the TEM confirmed zinc presence throughout the amorphous matter and the absence of individualized zinc crystalline particles. These results are in accordance with XRD which showed absence of zinc diffraction peaks, in all lactose samples containing zinc suggesting this metal could be modified from crystalline to amorphous state, and consequently adsorbed into lactose molecules. SEM structural analysis of lactose and zinc (1cH) samples using *BSE* detector showed no zinc metal grains confirming XRD and TEM results. DSC analyses presented statistical significance differences ($p < 0.05$) when fusion enthalpy values of zinc samples were compared.

Conclusions: This data shows the several ground cycles of zinc into lactose probably induced the amorphisation of the zinc crystalline particles, increasing the metal adsorption by lactose molecules.

Conflict of interest: None declared.

Keywords: physicochemical, homeopathy, *Zincum metallicum*, lactose

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