Novel Standardization and characterization of Vedi Annabethi Chenduram

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Abstract

Standardization of siddha preparations is an important task in establishing the safety and efficacy of the drug. Characterization of siddha formulation renders wide range of information in predicting the nature and structure of phyto constituents which renders the actual therapeutic efficacy of the formulation. The main aim of the present study is to standardize Vedi Annabethi Chenduram, a nano sized formulation and also to characterize the same by using Sophisticated techniques like Scanning Electron Microscope (SEM), Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-OES) and X-ray diffraction (XRD).

Keywords: Vedi Annabethi Chenduram, Standardization, Characterization, Sophisticated techniques.

Introduction

Siddha system of medicine is always remarkable due to the use of metals and minerals in their preparations. The metals /mineral drugs are treated with herbs which are given as bhasmas and chendurams. Bhasmas are fine ash obtained through incineration. Chendurams are prepared by the process of sublimation and they are very much potent medicines. They having some advantages like include better stability, lower dosage, and sustained availability

Materials and Methods

Details regarding the sample:

The ingredients of VABC are Iron sulphate and Potassium nitrate as mentioned in Gunapadam Thathu Jeevam.
Details regarding SEM Analysis:

To evaluate the size of the particle, surface topography SEM Analysis was carried out using at SAIF, IIT Madras. The sample was mounted on specimen stab, placed inside the microscope’s vacuum column evaporator and a beam of electrons passed from an electron gun, travelled through a series of magnetic lenses. The electrons are counted by detector and the signals are sent to the amplifier. The number of electrons dispersed from each spot of the sample builds up the resultant image. The micrographs obtained give sufficient data about the topography of the sample.

Details regarding ICPOES Analysis:

The Inductively Coupled Plasma Optical Emission Spectrometric analysis was done using Perkine Elmer Optima 5300 DV.

Details regarding XRD Analysis:

The XRD studies was done in IIT Madras by using Bruker discover D8 X ray diffractometer.

Results and Discussion

SEM Analysis:

Image of SEM analysis for VABC

The morphology of the VABC can be determined by SEM (FEI Quanta). A representative portion of each sample must be sprinkled onto a double side Carbon tape and mounted on aluminium stubs, in order to get a higher quality secondary electron image for SEM examination. We have observed from SEM photographs that particles are spherical in shapes and sizes are in the range from 0.5 micron to 2 microns. Although the particle sizes of different batches showed similarity, It seems that these particles are aggregates of much smaller particles. When dispersed in an aqueous medium, these preparations form a negatively charged hydrophobic particle suspension. This hydrophobicity gives the particles a tendency to aggregate together to form larger particles. VABC exhibited larger sizes and agglomeration of the particles. Therefore, the comparatively larger size may be due to the agglomeration of the particles by repeated cycles of calcinations involved in preparation.
ICP – OES Analysis:

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>As</td>
<td>188.979</td>
</tr>
<tr>
<td>Cd</td>
<td>228.802</td>
</tr>
<tr>
<td>Cu</td>
<td>327.393</td>
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<tr>
<td>Pb</td>
<td>220.353</td>
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<tr>
<td>Ni</td>
<td>231.604</td>
</tr>
<tr>
<td>Hg</td>
<td>253.652</td>
</tr>
</tbody>
</table>

The heavy metals such as Mercury, Lead, Arsenic, Cadmium, Copper, Nickel are present in the sample VABC as within the WHO permissible limits. This ICPOES Analysis clearly indicates the presence and quantity of some compounds and confirms that the drug is safe for therapeutic use.

XRD Analysis:

**Results of XRD**

X–ray power diffraction (XRD) is a rapid analytical technique primarily used for phase identification of a crystalline material and can provide information on unit cell dimensions. The obtained XRD clearly indicates that the given sample VABC is crystalline in nature. The peaks confirms that it has ferrous compound.

**Conclusion**

The SEM analysis of this siddha formulation Vedi Annabetti Chenduram reveals the surface morphology of the drug. The particles are spherical in shapes and sizes are in the range from 0.5 micron to 2 microns. The size of the particles are present in nano in range .This confirms that the drug Vedi Annabetti Chenduram can be considered as nano medicine. So the bioavailability of the drug is more.

The ICPOES analysis confirms the presence of heavy metals such as Mercury, Lead, Arsenic, Cadmium, and Nickel are identified within the WHO permissible limits. This clearly indicates that the drug is very safe for therapeutic use.

The XRD studies confirms that the drug is crystalline in nature. Hence it ensured the efficacy of VABC established the fingerprint for standardization of the effective metal formulation.
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