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**Standardization method and characterization of
Ayakaandha Abraga Chendhuram**

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Abstract

Modern techniques such as FTIR, SEM, ICPOES were used to generate physico-chemical fingerprint for Ayakaandha abraga Chendhuram (AAC), one of the herbo-metallic mineral siddha medicine prepared as per the siddha classical text by the process of calcination. Some particles in nano range were also identified.

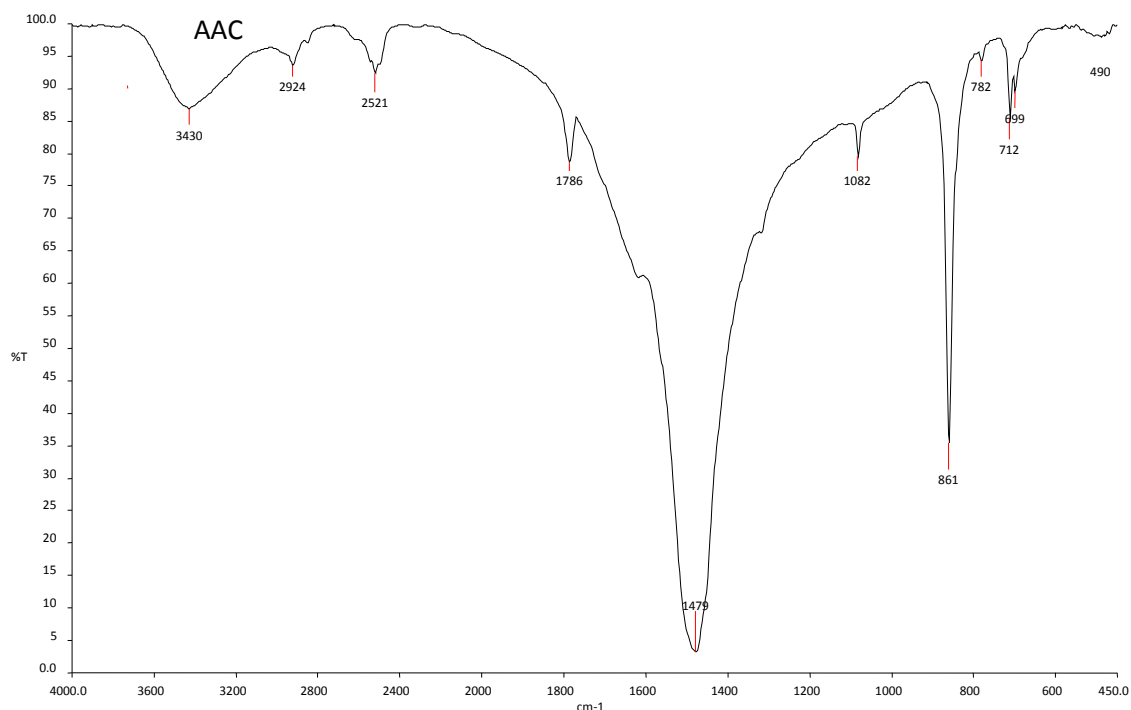
Keywords: AAC, FTIR, SEM, ICPOES, Siddha medicine, Ayakaandha abraga chendhuram

Introduction

Siddha system is one of the unique traditional medical system in the world. Siddha medical system is efficacious because of the numerous mineral and

Metallic formulations. Because herbo metallic preparations like "parpam", "chendhuram", "kattu" type of medicines having some advantages like include better Stability, lower dosage, ease of storability and sustained availability .

FTIR results of Ayakaandha Abraga Chendhuram:

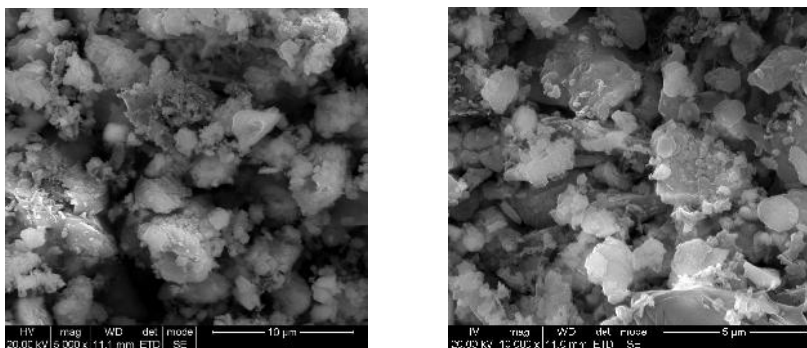


FTIR Interpretation of Ayakaandha Abraga Chendhuram:

WAVE NUMBER (CM-1)	VIBRATIONAL MODES OF AAC IN IR REGION	FUNCTIONAL GROUPS
3430	N-H STRETCH	Amines
2924	C-H STRETCH	Alkanes
2521	S-H STRETCH	Mercaptans
1786	C=O STRETCH	Anhydrides
1479	N-H BEND	Amines
1082	C-N STRETCH S=O STRETCH	Amines, Sulfonates
861	C-O STRETCH	Anhydrides
782	C-CL STRETCH	Alyl Halides
712	C-CL STRETCH	Acid Chlorides
699	C-CL STRETCH	Acid Chlorides
490	C-I STRETCH	Alyl Halides

In the FT-IR Spectra analysis, this *Ayakaandha abraga chendhuram* sample exhibits the peak value shows the wave number of 3430, 2924, 2521, 1786, 1479, 1082, 861, 782, 712, 699, 490 having N-H

STRETCH, C-H STRETCH, S-H STRETCH, C=O STRETCH, N-H BEND, C-N STRETCH, C-O STRETCH, C-CL STRETCH, C-I STRETCH.

SEM Analysis:**Results and interpretation of SEM analysis:**

The morphology of the AAC 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 these particles a tendency to aggregate together to form larger particles. AAC 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.

ICPOES:

As 188.979	BDL
Cd 228.802	BDL
Cu 327.393	BDL
Pb 220.353	BDL
Ni 231.604	BDL
Hg 253.652	BDL

The heavy metals such as Mercury, Lead, Arsenic, Copper, nickel and Cadmium are present in the sample AAC 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.

Discussion

The SEM images of the sample *Ayakaandha abraga chenduram* clearly confirms that most of the particles are observed as spherical in shape and it is present in the size of nano size nearly in and around 100 nm. These SEM images confirms that the particles present in the sample AAC is nano size.

The FTIR indicates the presence of some organic functional groups such as amine, alkanes, acids, carbonyl groups, alkyl halides, alkenes. And the presence of some inorganic compounds towards these observed frequencies such as Calcium Phosphate, Potassium Disulphate, Sodium Bicarbonate, Ferric Nitrate, Sodium Selenite, Ferrous Sulphate, Sodium Metaborate, Sodium Metasilicate, Sodium Terborate, Barium Carbonate, Sodium Metabisulphate.

Conclusion

The FTIR indicates those functional groups which were identified have some specific role in the therapeutic action of drug.

The SEM analysis of this siddha compound *Ayakaandha Abraga Chendhuram* reveals the surface morphology of the drug. The size of the particles are present in nano and near nano range. This confirms that the drug *Ayakaandha abraga chendhuram* can be considered as nano medicine. So, the bioavailability of the drug is more. This helps the targeted therapeutic drug delivery and action.

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

Since there are no scientific documentation is available regarding the nature of this siddha poly herbal formulation *Ayakaandha abraga chendhuram*. Now the above mentioned results of FTIR, SEM, ICPOES helps to create the finger prints to standardize this Siddha drug *Ayakaandha abraga chendhuram*. And these findings will helps as a platform to know the knowledge of the molecular structure of this drug.

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