

Shodhana of Vang by three different methods and its analytical study

Research article

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Abstract

The process of *shodhana* i.e. purification is designed for the alteration of the original properties of a substance. The concept of *shodhana* is being practiced in *ayurvedic* medicines since *samhita kala*. Term *shodhana* indicates the pharmaceutical process of purification of various metals and minerals which is essential before administering them into alchemical as well as therapeutic purpose, and this term is broadly used for *Samskara*. It was highly accepted by the Pioneers of *Rasashastra* (8th Century A.D.). Specifically for metals, to convert them into consumable, assimilable, body friendly, form it is important that their compact, hard structure be broken. *Vang dhatu* is grouped in *putilohas* and is extensively used in *ayurvedic* medicinal system for management of some critical diseases like *prameha*, *klaibya* etc. *Shodhana* and *Marana* are the basic procedures adopted for making these foreign and wild elements, body friendly and tamed to provide maximum benefit. There are a number of procedures explained in *rasashatriya* texts regarding *Shodhana* of *vang dhatu*. The Present paper is a sincere attempt to study physico chemical characteristics of *vang dhatu* purified by three different methods.

Keywords: *Vang*, *Shodhana*, *Dhalana*

Introduction

Therapeutic efficacy of the *Ayurvedic* drugs has been established and well documented by the great *Acharyas* in the form of classics attributed to them. However, lot of changes have occurred in our living milieu since the time these classics were written, Further the art of preparing the formulations requires certain amount of expertise and no information is available about the likely impact of changes in the manufacturing techniques. So it is need of the hour to study and well document, the effects of the different procedures carried out for obtaining the desired effects in pharmaceuticals preparations. One of the procedure explained is *shodhana* i.e. purification. The process of *Shodhana* is designed for the very alteration of the original properties of a substance. The concept of *shodhana* is being practiced in *ayurvedic* medicines since *samhita kala*. The ancient *Ayurvedic* Texts like *Charaka Samhita* have defined the concept of *Shodhana*. It says that *Karana* (Processing) is the refinement of the natural products which means imparting additional properties¹. Term *shodhana* indicates the pharmaceutical process of purification of various metals and minerals which is essential before administering them into alchemical as well as therapeutic purpose, and this term is broadly used for *Samskara*². The concept of *Shodhana* treatment was highly accepted by the Pioneers of *Rasashastra* (8th

Century A.D.). If searched for the specificity of the nature of the substances to be put to use to and the *shodhana* processes adopted for them, it can be easily seen that the process has to be comparatively soft for softer substances. Specifically for metals, to convert them into consumable, assimilable, body friendly form, it is important that their compact, hard structure be broken. The first activity in the process of *shodhana* of metals is heating them to red hot or to melt. When the metal is melted or heated to red hot. The next activity in the process *shodhana* immediately involves *nirvapa* or *dhalana*³ i.e. quenching in liquids at room temperature, the whole of the crystal lattice or grain structure is deformed.

Vang dhatu is grouped in *putilohas* and is extensively used in *ayurvedic* medicinal system for management of some critical diseases like *prameha*, *klaibya* etc. *Shodhana* and *Marana* are the basic procedures adopted for making these foreign and wild elements, body friendly and tamed to provide maximum benefit. There are a number of procedures explained in *rasashatriya* texts regarding *Shodhana* of *vang dhatu*.

The Present paper is a sincere attempt to study physico chemical characteristics of *vang dhatu* purified by three different methods.

Aim

To conduct the analytical study of *Vang* after *Shodhana* by using three different methods.

Objectives

- To study the concept of *Shodhana*.
- To study the various methods of *Shodhana* of *Vang* in different texts.
- To perform *Shodhana* of *Vang* by three different methods.

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To carry out analytical study of *Vang* after *Shodhana* by using three different methods.

Material:

- *Ashuddha vang*
- *Churnodaka*
- *Nirgundi swarasa*
- *Kumari swarasa*
- *Haridra churna*
- *Pithar yantra*
- Palika Yantra
- Pair of tongs
- Gas burner

Methods:

Three different methods of the *shodhana* (purification) were followed.

Method I – as per the reference in *rastarangini*; Small pieces of 100 g of *vanga dhatu* were prepared by using crushing method. Then the pieces of this metal were taken in a *loha darvi* (iron laddle). These pieces were melted by heating on low flame. The melted metal was immediately poured in a *pitharyantra* which was containing *churnodaka*. The sound heard during the process was noted. The purified cooled *vanga dhatu* after 1st purification was obtained, washed with lukewarm water, dried and weighed. The same process was performed for another six times in different *pitharyantras* with fresh *churnodaka*⁴. The final sample of purified *vanga* (Sn) was subjected for XRF analysis.

Method II – As per the reference of *rasatangini*, the *shodhana* of the *vang dhatu* was carried out in *kumari swarasa* seven times⁵.

Method III – Preparation of *haridrayukta nirgundi swaras*: 30g of *haridra churna* was mixed in 90ml of *nirgundi swaras* with constant stirring in SS vessel. This solution was divided into 3 equal parts and kept in 3 separate SS vessels for purification of *vanga*. The same procedure as mentioned above was carried out three times⁶.

Observations and results:

Observations during the *vanga* (Sn) purification process

All the procedures of *vang shodhana* of were carried out in the departmental laboratory of Y.M.T. Ayurvedic medical college, Kharghar, Navi Mumbai. Procedures were keenly observed and noted.

During the process of *dhalan* of liquefied *vanga* (Sn) into *pitharyantra* containing different liquid forms, a specific sound was noted. Initially it took 4-5 minutes for melting of *vanga* (Sn). The time taken for 2nd and 3rd step was comparatively more. Each time a greyish black coloured scum was formed over the surface while melting the *vanga* (Sn) on *daarvi*. Smoke was observed during successive heating. *Vanga* (Sn) was collected at bottom of the *pitharyantra* with a big mass and some powder particles. On successive heating the *vanga* (Sn) in powder form was seen more and more. Along with *shodhit vanga* some black coloured particles were seen adhered to it which may be due to *haridrayukta nirgundi swaras*.

Table no.1: Physical changes/ variations in *Vang* after three types of *Shodhana*.

	Weight	Weight loss after <i>Shodhana</i> (g)	Colour	Form	Smell during <i>Dhalana</i>
Raw vang	100g	-	Bright silver	Foil	-
In <i>Churnodaka</i>	30ml	8.6ml	Greyish silver	Pieces	-
In <i>Kumari swrasa</i>	30ml	18.86ml	Silver	Mass	-
In <i>Haridra yukta Nirgundi swarasa</i>	10g + 30ml	13.95ml	Bright silver + yellow tinge	Coarse powder	Herb smell

The elemental analysis was done with the help of X-ray Fluorescence (XRF) analysis of the raw and purified samples was done at Varsha Bullion & Elemental Analab, Mumbai-02. X-ray tube voltage of 15/50kV and current was used between 200-500µA. MODEL NO.-Horiba machine, Mesa-500. The XRF method depends on principles involving interaction between electron beam and X-ray with samples. The analysis of major and trace elements in material by XRF is made possible by the behaviour of atoms when they interact with radiation.

Table no.2: Elemental analysis of *Vang* by XRF in Mass %.

Elements	Raw <i>vang</i> (%)	<i>Churnodaka shodhit</i> (%)	<i>Kumari swarasa shodhit</i> (%)	<i>Nirgundi swarasa+ Haridra churna</i> (%)
(Cu) Copper	0.45	0.07	0.07	0.21
(Sn) Tin	99.08	99.85	99.88	98.83
(Pb) Lead	0.47	-	-	0.27
(Ca) Calcium	-	0.08	-	-

Discussion:

In the procedure of *shodhana*, the physical and chemical characteristics of raw *vang* changes at different stages. It is found that, after the *shodhana* procedure the reduction in weight of *vang* was minimum in *churnodaka* and maximum in *kumari swarasa*. i.e the weight loss was 8.6 g and 18.86 g respectively. After the *shodhana* of *vang*

by three different method, hardness of all the *shodhit* samples was reduced. But it was significantly reduced in *haridra churna yukt nirgundi swarasa*. *Shuddha vang* was obtained in the form of coarse powder in this type of *shodhana* procedure. Lustre was reduced in significant manner in *churnodaka shodhit vang* only. Colour changes during and after *shodhana* were different and specific for every method as mentioned in table no.1.

In the XRF elemental analysis of *vang* it was found that in the procedure of *vang shodhan* by *churnodaka* and *kumari swarasa* amount of Lead (Pb) content was reduced to zero i.e. it was totally absent in *shuddha vang*. Whereas 0.47 % lead (Pb) was present in the *Ashuddha vang*. Also the net Tin (Sn) content was found increased in *kumari swarasa shodhit vang* i.e. 99.88%.









Conclusion:

In the view of materials and methods used for *shodhana* and the results obtained from the organoleptic and chemical analysis, it can be concluded that the main objective of *shodhana* procedure i.e. purification of raw drug and removal of unwanted parts can be achieved. *Shodhana* is the initial and very important stage of *bhasmikiranana* (incineration) procedure. Here it can be clearly seen that the process of *shodhana* of *vang* provides perfect base for the *bhasma nirmana*. The changes in hardness, colour and shape were very significant in above mentioned procedures. The weight loss of *vang* was minimum in *churnodaka* and maximum in *kumari*, coarse powder form that is maximum reduction in hardness was obtained after *shodhana* in *haridra yukta kumari swarasa* which can help in *bhasmikiranana* of *vanga*, and mainly the absence of Lead (Pb) in *Kumari swarasa* and *churnodaka shodhit vang dhatu* was significant. Maximum Tin (Sn) percentage 99.88% was obtained by *Kumari swarasa shodhana*. Here it can be stated that the purest quality of *vang* can be obtained in *kumari swarasa shodhit vang* as compared with *Churnodaka* and *haridra churna yukta nirgundi swarasa shodhit vang*.

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Figure 1: Images of the Shodhana of Vang

Ashuddha Vang	Vang Shodhana: Churnodaka
	
Vang Shodhana: Kumari Swarasa	Vang Shodhana: Haridra churna yukta nirgundi swarasa
	
Temperature assesment by pyrometer	Dhalana
	
Shodhit Vang : Churnodaka	Shodhit Vang : Kumari Swarasa
	
Shodhit Vang : Haridra churna yukta nirgundi Swarasa	
