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ORIGINAL ARTICLE **OPEN ACCESS**

Synthesis of Nanoparticles in Folliculinum 200 under chemical method and influence of pulverization

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ABSTRACT

Folliculinum is Homoeopathic Sarcode commonly known as homoeopathic oestrogen. Folliculinum is made from oestrogen, a synthesis form of oestrogen secreted from ovarian follicles. Synthesis of Folliculinum in 200 potency nanoparticle with potassium ferricyanide along with standardization by UV visible Spectrophotometric analysis and amp: SEM scanning electron microscope. To synthesis Nanoparticle of Folliculinum 200 Potency. To Quality and quantify by UV visible spectrophotometric analysis and SEM scanning electron microscope. Through this method synthesizing the nanoparticles in the Folliculinum 200 potency with the help of Potassium Ferricyanide under the influence of potentization method. Analysis was completed under SEM Scanning electron microscope to visualize the massless structures in the solvent system. Afterwards successfully recognize the nanostructures in the given sample. Synthesis of Nanoparticles in Folliculinum 200 under chemical method and influence of pulverization was successfully prepared.

Keywords: *SEM, Folliculinum, Nanostructures, Potassium Ferricyanide*

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INTRODUCTION

Folliculinum is made from oestrone , a synthesis form of oestrogen which is in coloreless crystals or white to creamy white odorless powder, insoluble in water, springly soluble in acetone and in chloroform having chemical formula $C_{18}H_{22}O_2$ with Molecular weight 270.4.[1]. Chemical method is method of synthesizing the nanoparticles used for synthesis of Folliculinum in 200th potency with the help of Potassium Ferricyanide under the influence of potentization method. Nanoparticles are solid particles or particulate dispersions that range in size from 10 to 1000 nm. The drug dissolves, trapped, encased, or attached to a nanoparticle matrix. Depending on the preparation method, nanoparticles, nanospheres, or nanocapsules can be created. In contrast to nanocapsules, which hold the medicine inside a hollow surrounded by a unique polymer membrane, nanospheres are matrix systems in which the drug is evenly and physically dispersed. Because of their ability to target a particular organ, circulate for a long period of time, and function as DNA carriers in genes, biodegradable polymeric nanoparticles—particularly those coated with hydrophilic polymers like poly (ethylene glycol) (PEG), also known as long-circulating particles—have recently been investigated as potential drug delivery vehicles therapy, as well as their ability to transfer proteins, peptides, and genes [2–5]. The primary goals of developing nanoparticles as a delivery system are to control particle size, surface properties, and release of pharmacologically active compounds in order to achieve the site-specific action of the medication at the therapeutically optimal rate and dose regimen. Although liposomes have been used as potential carriers with unique advantages like protecting drugs from degradation, targeting to the site of action, and reducing toxicity or side effects, their applications are limited due to inherent problems like low encapsulation efficiency, rapid leakage of water-soluble drug in the presence of blood components, and poor storage stability. Nonetheless, polymeric nanoparticles offer a few special advantages over liposomes. For instance, They have useful controlled release properties and help to increase the stability of drugs or proteins. [6, 7].

MATERIAL AND METHODS

Type of study: Nanotechnology

Duration of study: 1 month

Site of study: Parul Institute of Homoeopathy & Research, Parul University, Vadodara, Gujarat, Micro Nano laboratory

Tool for analysis: SEM (Scanning electron microscope)

Laboratory utensil: pipette, Beaker 100 ml, spatula, mortar pestle, electronic balance, electric potentizer machine, glass rod, hot air oven

Medicinal: Folliculinum 200 potency

Chemical used: Potassium ferricyanide

Instrument details:

The Hitachi SU3800 SEM provides accurate nanoscale surface information through high-resolution characterization and analysis. It has sophisticated optics and detection systems, including as STEM, UVD, BSE, and SE detectors. With an EDS system for elemental composition analysis, the SEM offers detailed information regarding specimen surface morphology.

Key Features: mechanized stage with five axes and a maximum specimen diameter of 200 mm. 4.0 nm at 30kV (Low Vacuum Mode) for BSE and 3.0 nm at 30kV (High Vacuum Mode) for SE are examples of high resolution. For SE and CL imaging, a special Ultra Variable Pressure Detector (UVD II). Use the Oxford Xplore EDS system to map elements in real time. For creating conducting layers on non-conducting samples, use a gold sputter coating device.

Procedure

1st step: sterile all the laboratory utensils under Hot air oven for 10-15 minutes

2nd step: take 10 ml drug Folliculinum 200 potency with 1 gm potassium ferricyanide, 40 ml distilled water and 1 ml absolute alcohol after exposure of UV Light in UV- Visible spectrophotometer (Double beam), thereafter mix all the component in a 100 ml beaker

3rd step: mixes the solvent system with sterile glass rod until and unless homogenous mixture forms

4th step: take 1 gm sugar of milk by chemical balance and add 1 drop of solvent system prepared by chemical method in 1 gm sugar of milk, afterwards mixes with spatula, make it as a drug

5th step: take 9 gm of sugar of milk by chemical balance and divides into three parts as 3gm: 3gm: 3gm

6th step: There are three phases given below;

I Phase: add 1 gm drug with 3 gm sugar of milk in electric potentizer and starts trituration, scrapping, mixing for 20 minutes.

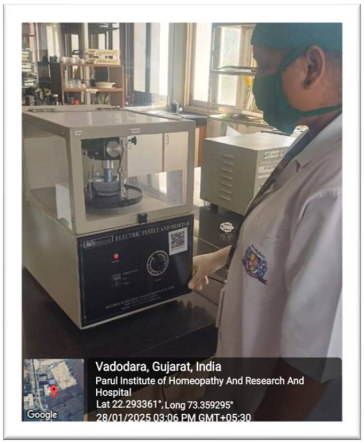
II Phase, after finishing 20 minutes add 3 gm of sugar of milk and starts trituration, scrapping, mixing for next 20 minutes.

III Phase: after finishing 40 minutes add 3 gm of sugar of milk and starts trituration, scrapping, mixing for next 20 minutes.

At the end of 60 minutes 1 X Potency prepared

7th step: take 1 gm of 1x in 20 ml distilled water, 1gm potassium ferricyanide for solvent system.

GLIMPSES OF RESEARCH WORK:



RESULTS

After scanning through SEM Scanning electron microscope, the results are given below;

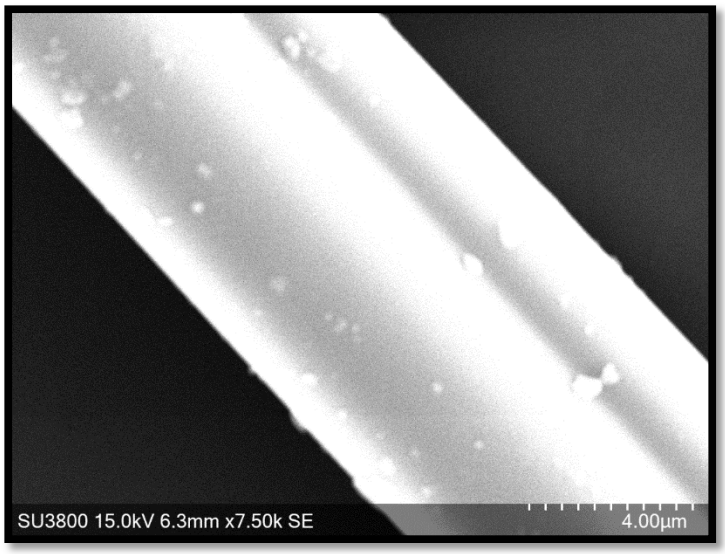


Figure. No. 1. SEM Scanning in *Folliculinum* 200 at 4 microns

Description: SEM image showing nanostructure presence in Folliculinum 200 sample at 4 microns.
Observation: Fine, irregular nanoparticle clusters indicate structural complexity at micron level.

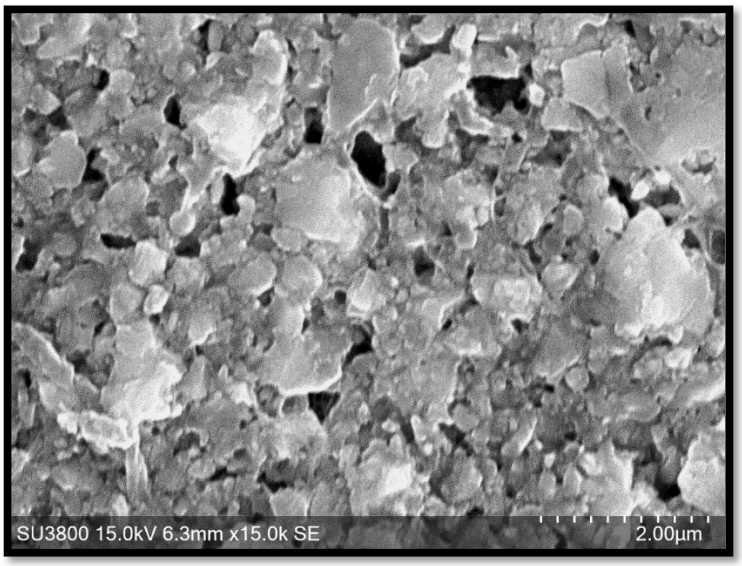


Figure. No. 2. SEM Scanning in *Folliculinum* 200 at 2 microns

Description: High-resolution SEM image at 2 microns of Folliculinum 200.
Observation: Dense particle formations, confirming nanoscale dispersion in the potentized drug.

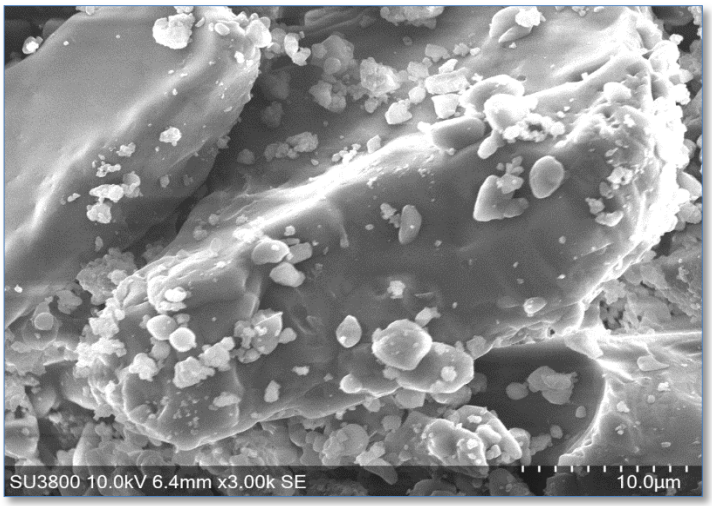


Figure. No. 3. SEM Scanning in *Sugar of milk* at10 microns

Description: Structural imaging of unmediated sugar of milk at 10 microns.
Observation: Coarse granulated structures, uniform without evidence of nanostructure interaction.

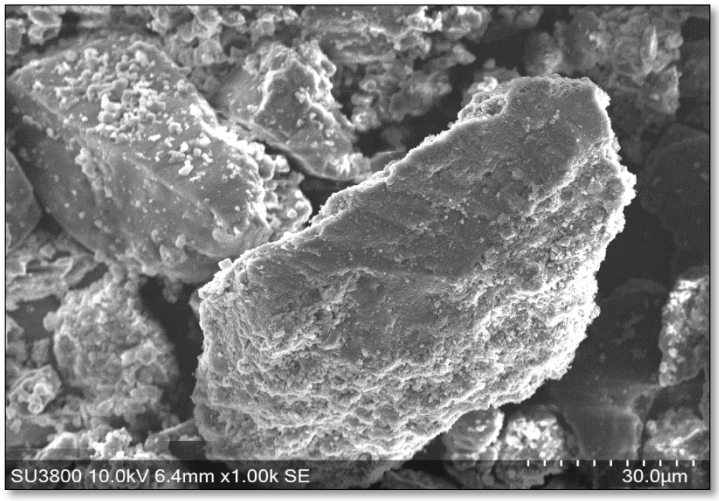


Figure 4. SEM Scanning of Sugar of Milk at 30 microns

Description: SEM imaging at a higher magnification range to observe surface morphology.
Observation: Large crystalline structures consistent with pure lactose morphology.

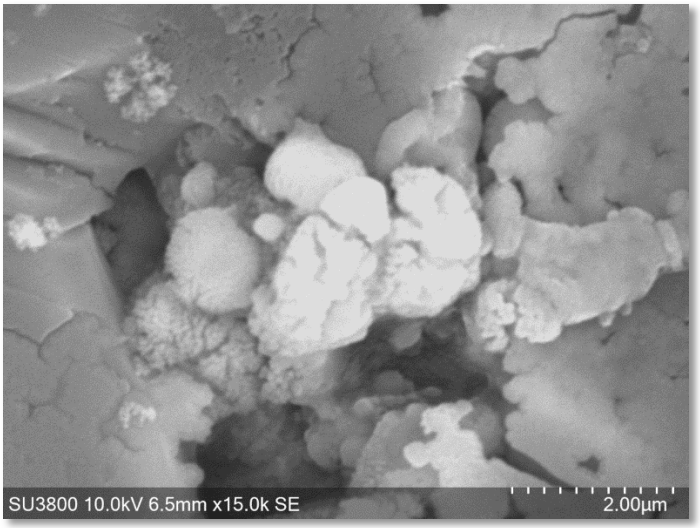


Figure 5. Solvent System Before treatment with Potentization – SEM at 2 microns
Description: Nanoparticle distribution in untreated solvent system.
Observation: Aggregated, unorganized particles; no drug interaction visible.

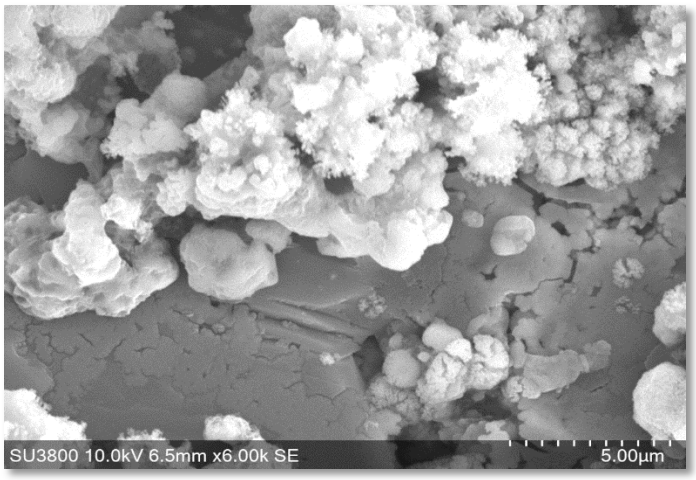


Figure. No. 6. Solvent system before treatment with potentization SEM Scanning at 5 microns
Description: SEM view at slightly lower magnification than Fig. 5.
Observation: Coarse, grain-like particles with loose surface arrangement.

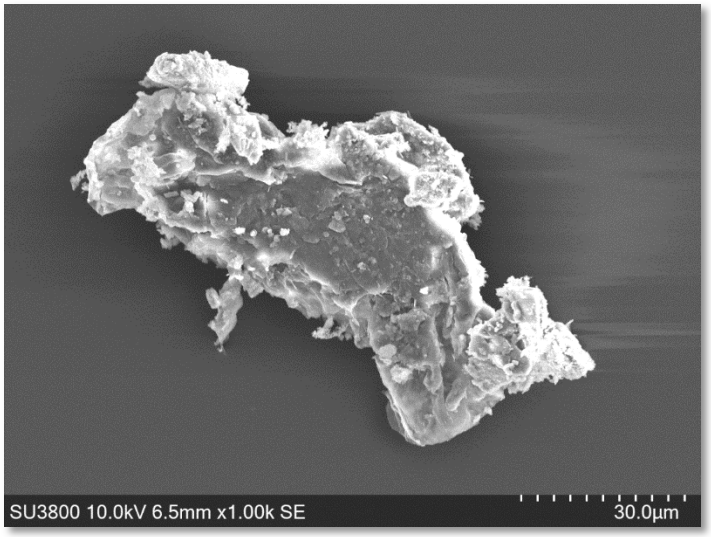


Figure. No. 7. Solvent system after treatment with potentization SEM Scanning at 30 microns
Description: SEM imaging at a higher magnification range to observe surface morphology.
Observation: Large crystalline structures consistent with pure lactose morphology.

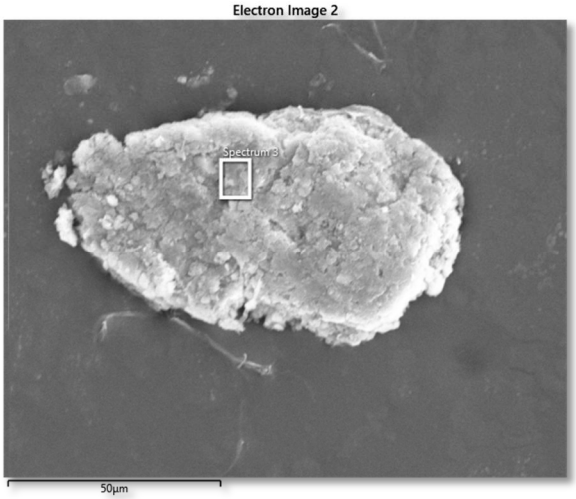


Figure 8. Solvent System Before Potentization – SEM at 2 microns
Description: Nanoparticle distribution in untreated solvent system.
Observation: Aggregated, unorganized particles; no drug interaction visible.

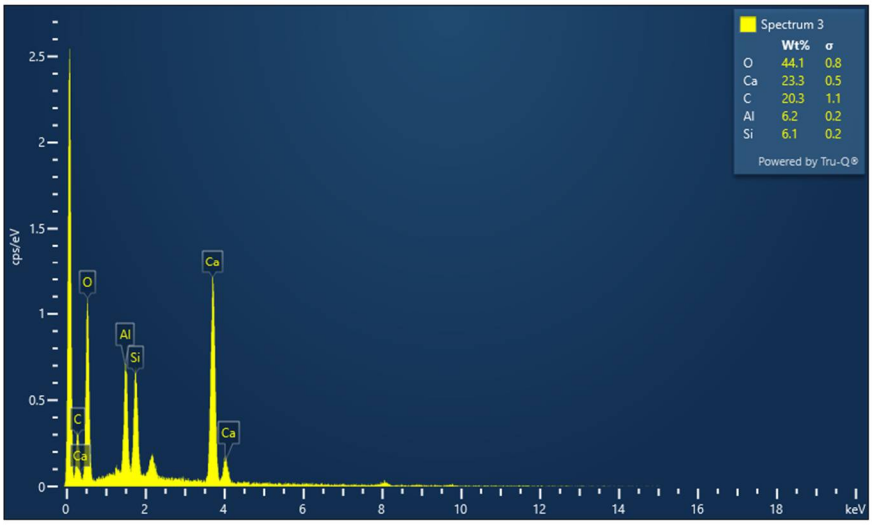


Figure 9. Solvent System Before Potentization – SEM at 5 microns
Description: SEM view at slightly lower magnification than Fig. 5.
Observation: Coarse, grain-like particles with loose surface arrangement.

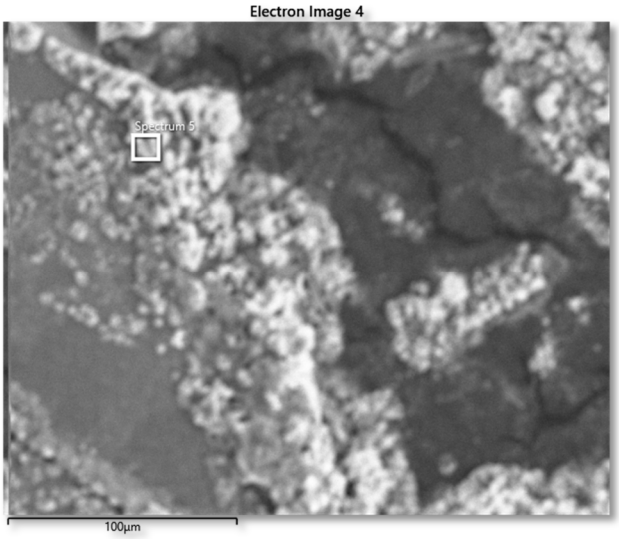


Figure. No. 10. Solvent system before treatment with potentization SEM & EDS Scanning at 100 Microns
Description: Wide-range analysis for base solvent characteristics.
Observation: Shows high Cl, K, Na levels typical of potassium ferricyanide.

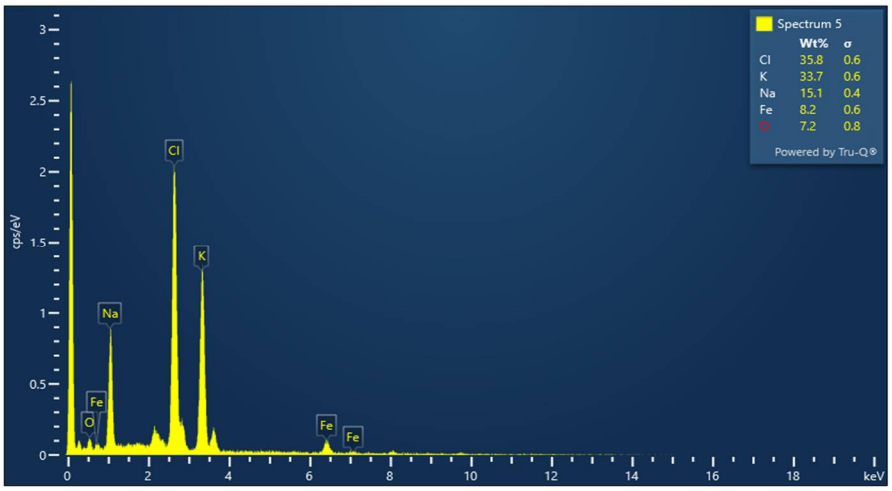


Figure 11. Solvent System before Potentization – SEM & EDS Spectrum
Description: Atomic mapping of the untreated solvent system.
Observation: Reinforces the salt-based composition.

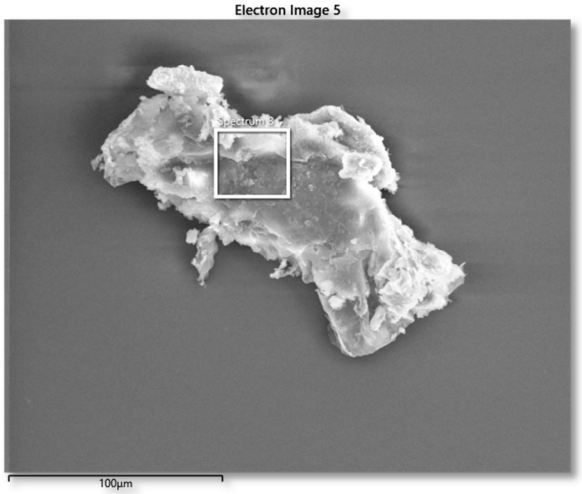


Figure. No. 12. Solvent system after treatment with potentization SEM & EDS Scanning in in 100 microns
Description: Post-potentization surface structure and elemental changes.
Observation: Increased carbon and organic traces indicate successful potentization.

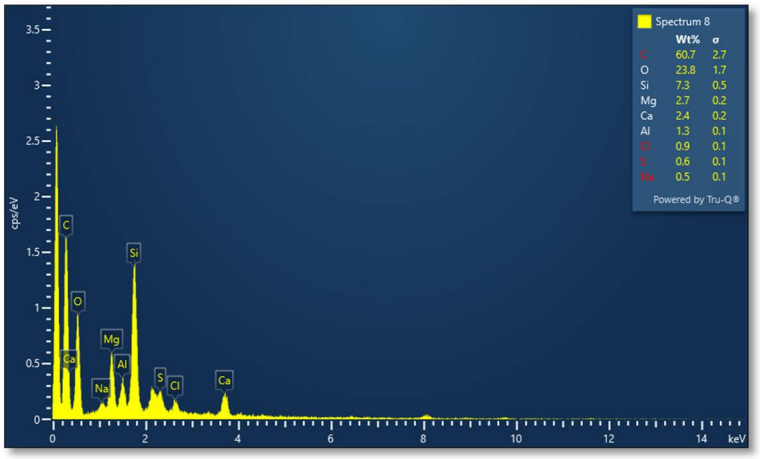


Figure. No. 13. Solvent system before treatment with potentization SEM& EDS Spectrum Scanning
Description: Confirms atomic redistribution and drug imprint.
Observation: Drop in Na, K, Cl; rise in carbon shows nanoparticle presence.

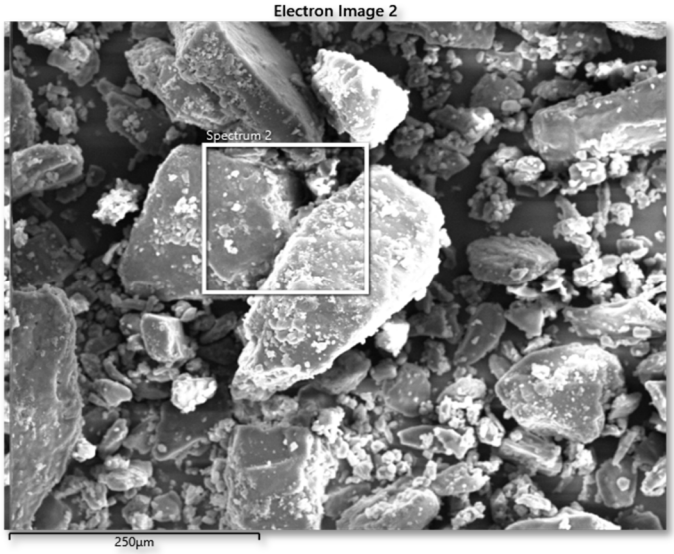


Figure 14. SEM & EDS Scanning of Sugar of Milk at 250 microns
Description: SEM imaging of lactose base at high magnification.
Observation: Regular crystal-like structure with uniform morphology.

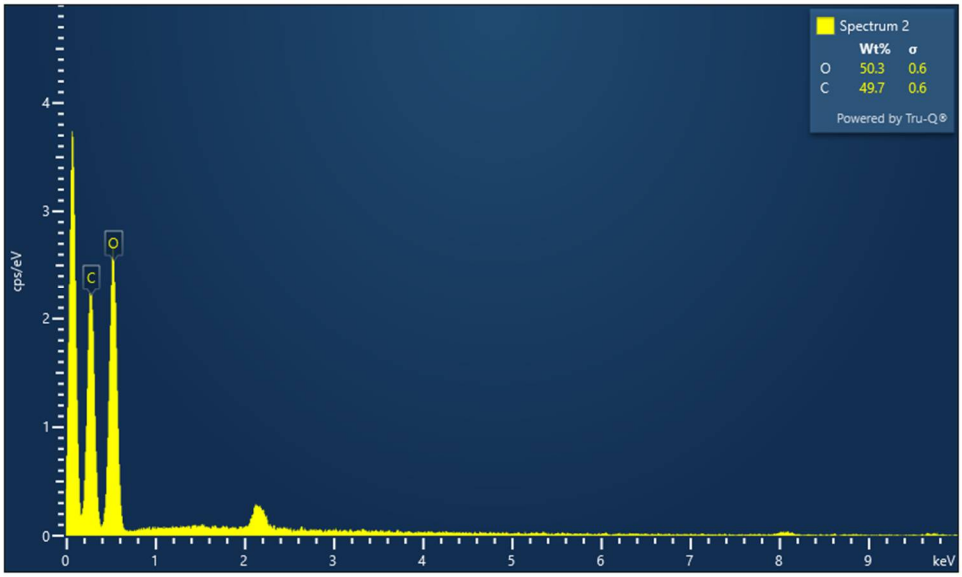


Figure 15. SEM & EDS Spectrum of Sugar of Milk at 250 microns
Description: Confirms elemental purity of base medium.
Observation: Balanced carbon and oxygen; no contamination found.

Element	Signal Type	Wt%	Wt% Sigma
C	EDS	20.31	1.06
O	EDS	44.13	0.80
Al	EDS	6.20	0.20
Si	EDS	6.06	0.20
Ca	EDS	23.29	0.47
TOTAL	**100.00**		

Table. No. 1. Table 1: SEM & EDS Spectrum of Folliculinum 200 in 50 Microns (Weight %)
Description: This table shows the weight percentage of elements present in Folliculinum 200 sample observed under SEM-EDS at 50 microns.
Analysis: The major constituents were **oxygen (44.13%)** and **calcium (23.29%)**, indicating the presence of mineral and organic matter. **Carbon (20.31%)** represents organic drug content, while **Al (6.20%)** and **Si (6.06%)** suggest some inorganic residue or contaminants from excipients or instruments.

Element	Signal Type	ATOMIC%
C	EDS	30.88
O	EDS	50.37
Al	EDS	4.19
Si	EDS	3.94
Ca	EDS	10.61
TOTAL	**100.00**	

Table 2: SEM & EDS Spectrum of Folliculinum 200 in 50 Microns (Atomic %)
Description: This table shows the atomic percentage of elements for the same Folliculinum 200 sample as in Table 1.
Analysis: The atomic percentage reveals **oxygen (50.37%)** and **carbon (30.88%)** as dominant, which supports the organic molecular nature of the Folliculinum 200 potency. **Calcium (10.61%)** affirms the presence of base excipients like lactose.

Element	Signal Type	Wt%	Wt% Sigma
O	EDS	7.19	0.80
Na	EDS	15.13	0.39
Cl	EDS	35.82	0.57
K	EDS	33.71	0.57
Fe	EDS	8.16	0.59
TOTAL	**100.00**		

Table 3: Solvent System Before Potentization (Wt%)

Description: Elemental composition of the solvent system (potassium ferricyanide-based) before treatment.
Analysis: High levels of **chlorine (35.82%)**, **potassium (33.71%)**, and **sodium (15.13%)** correspond to the chemical formulation of the solvent system. Presence of **Fe (8.16%)** confirms the ferricyanide base.

Table No. 4. This Table Contain the reading of. Figure. No. 8 Solvent system before treatment with potentization SEM& EDS Spectrum Scanning

Element	Signal Type	ATOMIC%
O	EDS	14.37
Na	EDS	21.05
Cl	EDS	32.32
K	EDS	27.58
Fe	EDS	4.67
TOTAL	**100.00**	

Table 4: Solvent System before Potentization (Atomic %)

Description: Atomic percentage of elements in the solvent system before potentization.
Analysis: This data reiterates the ionic presence of **Cl**, **Na**, **K**, and **Fe**, signifying the expected salt-based structure of potassium ferricyanide solvent system.

Element	Signal Type	Wt%	Wt% Sigma
C	EDS	60.68	2.73
O	EDS	23.79	1.72
Na	EDS	0.45	0.10
Mg	EDS	2.68	0.21
Al	EDS	1.30	0.13
Si	EDS	7.32	0.52
S	EDS	0.56	0.11
Cl	EDS	0.86	0.11
Ca	EDS	2.37	0.21
TOTAL	**100.00**		

Table 5: Solvent System After Potentization (Wt%)

Description: Weight % composition after the potentization process.
Analysis: The rise of carbon (60.68%) and oxygen (23.79%) indicates structural reformation due to potentization, highlighting the nanoparticle drug imprinting on the solvent system. Trace minerals like Mg, Si, and Ca emerge, suggesting successful drug material transfer.

Table 6: Solvent System after Potentization (Atomic %)

Element	Signal Type	ATOMIC%
C	EDS	71.37
O	EDS	21.01
Na	EDS	0.28
Mg	EDS	1.56
Al	EDS	0.68
Si	EDS	3.68
S	EDS	0.25
Cl	EDS	0.34
Ca	EDS	0.84
TOTAL	**100.00**	

Description: Atomic % data corresponding to Table 5.
Analysis: Significant increase in **carbon (71.37%)** validates the formation of nanostructures or carbon-based remnants of Folliculinum. Decrease in metal ions indicates chemical integration into carrier media.

Element	Signal Type	Wt%	Wt% Sigma
C	EDS	49.68	0.56
O	EDS	50.32	0.56
TOTAL	**100.00**		

Table 7: SEM & EDS Scanning of Sugar of Milk (Wt%)

Description: Basic elemental composition (by weight) of sugar of milk used in trituration.
Analysis: A simple structure of **carbon (49.68%)** and **oxygen (50.32%)** confirms the molecular purity of lactose as a base medium.

Element	Signal Type	ATOMIC%
C	EDS	56.81
O	EDS	43.19
TOTAL	**100.00**	

Table 8: SEM & EDS Spectrum of Sugar of Milk (Atomic %)

Description: Atomic % composition of sugar of milk.
Analysis: Carbon dominance (56.81%) affirms lactose structure, no impurities detected. Validates its suitability as a carrier for potentization.

CONCLUSION

Synthesis of Nanoparticles in Folliculinum 200 under chemical method and influence of pulverization was successfully prepared. study shows different nanoparticle were observed at different microns such nanoparticle are Calcium(C), Oxygen(O), sodium(Na), Magnesium (Mg), Aluminium(Al),silica (Si),Sulphur (S), calcium (Cl),Carbon (Ca).

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