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Design Development & Evaluation of Glass Microspheres based Herbal Antiaging Cream: A New Era of Creams

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Abstract:- As we know that aging is a major problem in both male & female. In the Skin aging causes progressive losses of elasticity, firmness, hydration & even skin tone resulting from many intrinsic and extrinsic factors. Commonly symptoms of aging skin are increased wrinkles, skin laxity, and pigmented lesions as well as decreases in skin thickness and the elastin and collagen components. Silica microspheres are now a days very popular, & prime choice skin care additive for beauty, cosmetic and personal care manufacturers which can enhance resultant effect more as compare to conventional beauty products. Silica microspheres are spherical particles of amorphous silica that measure 3 to 20 microns in diameter because it impart a silky consistency and a matte appearance, so it can be improves the look and feel of cosmetic, beauty and skin care products. Which enhance retention time of cream in skin & due to presence of all herbal ingredients like rose petal powders Avocado oil, Jojoba oils , Kajoic acid & aloevera gel produced greatest application against antiaging. Glass microspheres prepared by solvent evaporation technique by using silica powders which contain rose petal powder as the core material. Cream base prepare by emulsification of aqueous phase & oil phase in which prepared glass microspheres incorporated homogenously. Prepared microspheres were evaluated like texture, appearance, smoothness , irritation & sensitivity to skin.

Keywords:- *Glass /Silica Microspheres, Antiaging, Herbal , Avocado Oil.*

I. INTRODUCTION

Skin aging is a very complicate process in which continuously losses in elasticity, firmness, hydration, and skin tone due to many intrinsic and extrinsic factors. The very common symptoms of older skin are increased wrinkles, skin laxity, and pigmented lesions and even decreases in skin thickness and the elastin and collagen components. According to Kim et al demonstrated a decrease in skin elasticity with age in women and reported that adult skin shows a higher degree of fatigue than young skin.

Cosmetic formulators refers advance tools to create new looks and solve problems that older ingredients cannot give the desired action. In the continuation of advance methodology of cosmetics select mostly glass or some times ceramic as the base material . There are lots of benefits of glass which is also known as silica material prove silky consistency & matte appearance.

II. MATERIAL & METHOD

➢ *Silica*

Silica, also known as silicon dioxide, is a naturally obtained material. It is generally colorless or white and insoluble in water. There are two primary forms of silica: crystalline silica and amorphous silica. Crystalline silica has shows a variety of health hazards, such as cancer and allergies. For that reason, commercial skincare and cosmetic applications prefer using ingredients that don't have those health hazards. Amorphous silica and hydrated silica are GRAS (generally regarded as safe) ingredients of personal care products like makeup and sunscreen.

Fig 1 Silica Powder

➢ *Classification of Silica*

- Natural/ Synthetic
- Crystalline /Amorphous
- Porous / Nonporous
- Hydrophobic /Hydrophillic
- Pure / Composite

➢ *Advantages of Silicas in Cosmetics and Skincare:*

- It gives natural exfoliation (abrasive agent)
- It is absorb oil and sweat of skin.
- Its help in makeup adhere better to the face.
- It may provide a matte finish (opacifying agent)

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- It may thicken the consistency of creams and lotions.
- It will help in foundations spread onto the skin (bulking agent).
- It may improve the distribution of pigments (anticaking agent).
- It may prevent cosmetics from settling into makeup (suspending agent).

➢ *Red Rose Petal Powder*

Most **rose** species are very commonly available in Asia, while very less or we can say smaller numbers being native to North America and a few to Europe and northwest Africa. **Roses** are most common choice for creams & other cosmetics due its easy availability, better result, and good appearance of the product. Here we select rose petal powder as the core material for removal of antiaging problem of skin.

Fig 2 Rose Petal Powder

➢ *Avocado Oil*

Avocados are a rich dietary source of monounsaturated fatty acids, carotenoids, and phenolic compounds. It shows best effect against antiaging problems. We purchased 30ml of Avocado oil by online.

Fig 3 Avocado Oil

It shows antioxidants and anti-inflammatory effects of avocado oil which help to skin stay smooth, strong, and elastic.

➢ *Jojoba Oil*

Fig 4 Jojoba Oil

It is very common & most selected ingredients of antiaging products .It may help reduce the appearance of fine lines and wrinkles. It may help minimize the appearance of scar also. 30ml of Jojoba oil procured from local cosmetics shop Pune, India.

➢ *Kajoic Acid*

Kojic acid is a skin-lightening ingredient which can obtained from mushrooms. Kojic acid has anti-aging and antioxidant properties so it is one of the prime component in antiaging products. 30ml of Kajoic acid procured from local cosmetics shop Pune, India

Fig 5 Kajoic Acid

➢ *Aloevera*

Aloe Vera is a powerhouse of nutrients which can help slow down the aging process and reduce the appearance of wrinkles even scars. It's rich in vitamins A, C, and E, which enhance their antioxidant properties. 100 gm of Aloevera Gel from procured from local cosmetics shop Pune, India.

Fig 6 Aloevera Gel

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III. FORMULATION OF GLASS MICROSPHERES

Table 1 Formula for Glass Microspheres Antiaging Cream

INGREDIENTS	PERCENTAGE REQUIRES	Roll of Ingredients
I. Microspheres for 3gm		
HPMC/microcrystalline cellulose	3gm	Coating agent
Silica powder	3.5%	Provide a matte finish
Isopropyl alcohol	20ml	Solvent
Polyvinyl alcohol	2.5%	Solubilizing agent
Tween 80	0.2ml	Surfactants
II. Cream base for 50gm		
Rose petal powder	4%	Antiaging agent
Cetyl alcohol	3%	Thicken the consistency of creams
Stearic acid	6-7%	Pearlscent effect
Triethanol Amine	2%	Thicken the consistency of creams
Glycerine	2%	Humectants
Olive Oil	6%	Antiaging agent
Avocado Oil	6%	Antiaging agent
Kajoic Acid	4%	Antiaging agent
Vitamin E	4%	Nourishment
Rose Oil	6%	Flavouring agent
Jojoba Oil	6%	Antiaging agent
Potassium Hydroxide	1.5%	Alkalizer
Distilled water	10ml	Solvent

A. Procedure:

➢ *Preparation of Microspheres:*

Dissolve Silica, HPMC & microcrystalline cellulose in prescribed quantity of isopropyl alcohol to give a homogenous solution in a closed vessels. Added rose petal powder & stirrer well at room temperature. Poured the above solution in 2.5%w/v PVA solution with continuous stirrer using magnetic stirrer & maintaining temperature at 30-40^{0}C.Glass microspheres prepared by Solvent evaporation technique which containing rose petal powder as core material.

➢ *Preparation of Cream Base:*

- *Phase A*

✓ *Oil Phase :*

Melted stearic acid first in a porcelain dish. Added cetyl alcohol & all oils like Oliv Oil ,Avocado Oil, Kajoic Acid ,Vitamin E, Rose Oil & Jojoba Oil with continuous stirring.

- *Phase B*

✓ *Aqueous Phase:*

Mixed Triethanol amine,glycerine, Methyl parabene, aloevera gel, potassium hydroxide in water with continuous stirring at 30-40^{0}C.

At a constant temperature , near about 40^{o}C ,aqueous phase mixed in oil phase drop wise with continuous stirring until get smooth cream base.

➢ *Preparation of Glass microsphere based herbal antiaging cream:*

Prepared microspheres incorporated in cream base with the help of glass rod or spatula to get well homogenous smooth cream.

Fig 7 Basic Requirements

Fig 8 Preparation of Cream

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B. Preparation of Formulation: F_1,F_2,F_3 & F_4

Table 2 Formulations Glass Microspheres & Antiaging Cream

Ingredients	F_1	F_2	F_3	F_4
I. **Microspheres for 3gm**				
HPMC/microcrystalline cellulose	3gm	4gm	2gm	3gm
Silica powder	3.5%	2%	2%	3.5%
Isopropyl alcohol	20ml	20ml	20ml	20ml
Polyvinyl alcohol	2.5%	2.5%	2.5%	2.5%
Tween 80	0.2ml	0.2ml	0.2ml	0.2ml
II. **Cream base for 50gm**				
Rose petal powder	4%	2%	2%	5%
Cetyl alcohol	3%	3%	3%	3%
Stearic acid	6-7%	6-7%	6-7%	6-7%
Triethanol Amine	2%	2%	2%	2%
Glycerine	2%	2%	2%	2%
Oliv Oil	6%	6%	6%	6%
Avocado Oil	6%	6%	6%	6%
Kajoic Acid	4%	4%	4%	4%
Vitamin E	4%	4%	4%	4%
Rose Oil	6%	6%	6%	6%
Jojoba Oil	6%	6%	6%	6%
Potassium Hydroxide	1.5%	1.5%	1.5%	1.5%
Distilled water	10ml	10ml	10ml	10ml

C. Evaluation Parameters

Table 3 Evaluations of Glass Microspheres & Antiaging Cream

Evaluation parameters	F1	F2	F3	F4
Appearance	Excellent Pink coloured cream	Poor light Pink coloured cream	Good light Pink coloured cream	Poor Dark Pink coloured cream
Irritation	NO	No	No	NO
Texture	Smooth	Smooth	Smooth	Smooth
Sensitivity Reaction	No	No	No	NO
Phase separation	NO	No	No	NO
Spreadability	Excellent	Good	Good	Poor

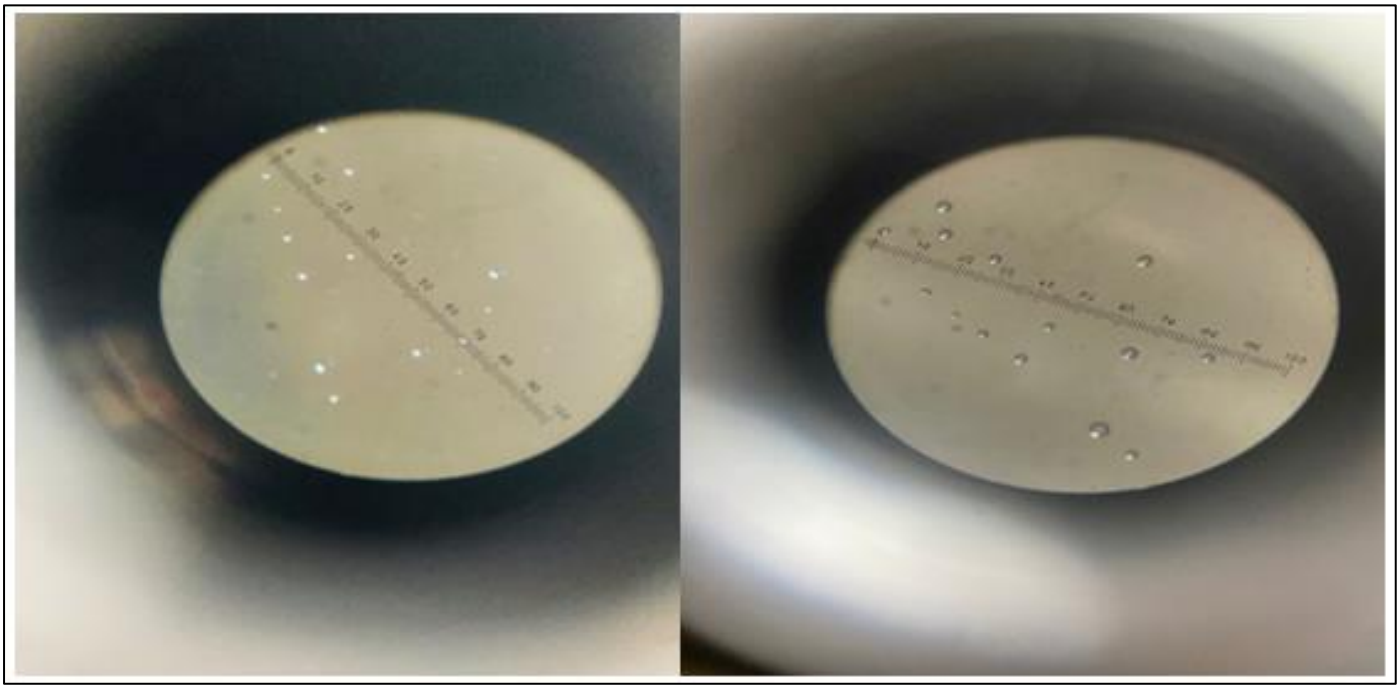

Fig 9 Microscopic Observation of Glass Microspheres (F1)

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IV. RESULT & DISCUSSIONS

Silica/Glass microspheres are spherical particles of amorphous silica that showed diameters of 03 to 20µm. Glass microspheres always give a silky consistency and a matte appearance, which can increases the look and feel smooth to cream. I had prepared four formulations with different composition & concluded on the basis of evaluation parameters F_1 shows very good characteristics to fulfils the properties of antiaging cream. Microspheres based cream provide maximum possible retention to herbal components on skin which can impart to reduce the wrinkle or aging . Silica is a chemically stable inorganic synthetic material that's why we prefer in designing of microsphere. It has the benefit of providing no irritation to human skin. Silica is essentially transparent, colorless and promote a high degree of slip & smoothness to cream. Due to this skin feel very lubricious in nature & better skin tone. We have planned to promote the technology of microspheres based cream in future resultant antiaging for male & female skin of humans.

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