CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187
https://doi.org/10.5281/zenodo.8064512

Available online at: http://www.iajps.com *Research Article*

FORMULATION AND EVALUATION OF FACE SERUM

Dr. Raju Balaji Reddy [1], Faiza Ashfaq[2], Nazneen Begum[3*], Kainaat Fatima[4].
Department of Pharmaceutics, Deccan School of Pharmacy, Aghapura Hyderabad -500001

Abstract:
The main focus of this research study was to develop a effective face serum using salicylic acid and ascorbic acid. Four formulations where each contains 2% w/w salicylic acid and 2% w/w ascorbic acid with varying concentration of another excipients. The prepared face serum were examined visually, pH, viscosity, globule size determination, spreadability, homogeneity and after feel. Upon evaluation, the Formulation F4 showed ideal suitable pH to the skin and globule size.
Through this research work we intend to show safe and effective face serum and proven to be effective as anti pigmentation and anti acne. Salicylic acid is well-known for its effectiveness in treating acne. It works by exfoliating the skin, unclogging pores, and reducing the formation of acne-causing bacteria. Ascorbic acid acts as antioxidant protection helps in collagen production, anti pigmentation (brightening and even skin tone), sun damage protection and anti-inflammatory effects. Our prepared face serum is suitable for skin care purposes.
Key words: *salicylic acid, ascorbic acid, Anti-pigmentation, Anti-acne.*

Corresponding author:
Nazneen Begum,
Department of Pharmaceutics,
Deccan School of Pharmacy, Aghapura Hyderabad -500001
E-mail : nazneenbegum897@gmail.com
Contact number: 9391181790

QR code

Please cite this article in press Nazneen Begum et al, ***Formulation And Evaluation Of Face Serum.,*** *Indo Am. J. P. Sci, 2023; 10 (05).*

INTRODUCTION:

Nowadays, a skincare regimen is a collection of procedures for caring for one's own skin. This procedure is critical for maintaining the skin's good and healthy state. This skin routine must be specific to your skin type. [1] The term "Cosmeceutical" describes the union of the pharmaceutical and cosmetics industries. Pharmaceutical firms make medications, and cosmetics companies make cosmetics. Cosmeceuticals are skincare items that blend cosmetics and medications. [2] The skin covers the majority of the body and serves as its best form of protection for 24 hours, but there can be times when it can become dry for a variety of reasons, including exposure to UV radiation, contaminants, and cosmetics that have been worn overnight and may create allergies or rashes. [3] Serums are a type of skin care product with a gel, light lotion, or moisturising consistency that can enter the skin more deeply to release active ingredients. [4] One cosmetic product that has a very high concentration of active ingredients in its composition for intensively nourishing the deeper skin layer and a non-greasy finish that is ideal for skin is serum. Based on its rate of absorption and capacity to reach the deeper layers of the skin, cosmetic serum was categorised. Serum will not include sunscreen active components as a daytime moisturiser would, but serum will still have more antioxidants than any other product because of the extra storage space.[2] Salicylic acid is a comedolytic beta hydroxy acid. This lipid-soluble phytohormone has a moderate impact on acne treatment.[5] Salicylic acid is a common component of cosmetic products used to treat acne, blackheads, whiteheads, and pigmentation. Additionally, it exfoliates, decreases oily skin, and has anti-aging properties. [6] For more than 2000 years, salicylic acid has been used topically to treat a variety of skin disorders. [7] In order to effectively combat blemishes and acne, salicylic acid is capable of directly dissolving keratin plugs, known as keratosis pilaris, and regulating skin cells. Salicylic acid is appropriate for all skin types but ideal for blemish prone and diverse skin types, because it significantly inhibits the formation of clogged pores and has anti inflammatory properties. [8] Ascorbic acid (vitamin C) is the most abundant and typical water-soluble nonenzymatic antioxidant in human tissues. [9,10] Ascorbic acid protects the skin from oxidative stress by neutralizing free radicals by donating electrons in turn, since the oxidized form of ascorbic acid is relatively inactive. The ability of ascorbic acid to be absorbed into the skin is reduced by repeated exposure to UV light. In the skin, ascorbic acid plays an important role in its synthesis, depigmentation and antioxidant action. [11] Ascorbic acid plays an important role as Anti-pigmentation agent. The enzyme acts by interfering with copper ions at the active state of the tyrosinase enzyme, which inhibits its action. The main enzyme responsible for the transformation of tyrosine into melanin, thereby reducing melanin formation, is tyrosinase. [12]

MATERIALS AND METHODS:

Materials:

Salicylic acid, ascorbic acid, Glycerin, rose water, Aloe vera gel (Scien O Chem Enterprises), rosemary oil (Munna lal Dawasaz)

Equipment's:

Electrical Analytical Balance, Porcelain Dish, Beaker, Glass rod, Measuring cylinder, Funnel, Tripod stand, Filter paper, spatula, pH meter, microscope, Ostwald viscometer.

Method of Preparation:

- Take 2gm or salicylic acid in a pestle and mortar, triturate it until fine powder is formed and then add drop wise glycerine to obtain homogenous formulation.
- Take 2 gm of ascorbic acid in a mortar and pestle. Triturate it to reduce particle size and then add rose water to dissolve Ascorbic acid and stir continuously until it completely mixed and filter it.
- Add glycerin and aloe vera gel with continuous stirring until homogenous mixture is formed.
- Add drop wise of Rosemary oil to the formulation and then make up the volume up to 20 ml
- Fill the above product into a suitable container and label it.

Figure 1 : Measuring ingredients

Figure 2 : Filtration

Figure 3: Final Formulation

FORMULATION:

Table 1: Formulation:

Ingredients	F1	F2	F3	F4
Salicylic acid	2%	2%	2%	2%
Ascorbic acid	2%	2%	2%	2%
Glycerin	5%	4%	6%	5%
Aloe vera gel	5%	6%	4%	5%
Rosemary oil	1%	1%	1%	0.5%
Rose water	Q.S to 20ml	Q.S to 20ml	Q.S to 20ml	Q.S to 20ml

Formulation composition of respective face serum oil in water based biphasic emulsion.

EVALUATION:

- **Physical Appearance:** Observe the color of the serum formulation sample which should be in white milky and glossy appearance. Next, feel some serum formulation sample on the skin to access the texture which should smooth homogeneous texture and non-greasy finish.[(2)]
- **pH Test:** The pH test will be determined by using a Digital pH meter. Dipper of digital pH will be deep into the sample of serum formulation and the pH value will be recorded. The pH of the formulation should have acidic pH as the skin is having an acidic pH of around 4–6.[(2)]
- **Homogeneity:** This will be confirmed by spread some of the serum formulation on the transparent glass and observe it. The formulation should produce uniform distribution of serum.[(2)]
- **Spreadability:** When applying gel to skin or an affected area, spreadability refers to the size of the area to which the gel spreads easily. The spreading value of serum also affects how well it is bioavailable.[(13)]
- **Globule size determination:** Serum has analysed under microscope to confirm the globule size a drop of serum was placed on glass slide and diluted with water covered by glass cover and was observed under microscope.[(14)]
- **Viscosity:** It was determined by Oswald viscometer. 10 ml solution filled in Oswald viscometer. The flow of solution was observed in time A to B point in viscometer. At least 3 readings taken. These readings taken against water viscosity.[(15)]
- **After feel:** The serum after distribution amongst individuals and their application, had a soothing and pleasant effect as informed to us by the individuals, indicating that it had an emollient and moisturizing action and also it was non-irritating and non-sensitive to the skin.[(16)]

RESULT AND DISCUSSION:

1. **Physical Examination:**
   Table 2: Result of physical examination

Color	Yellowish, translucent
Odor	Characteristic odor
Taste	Tasteless
Texture	Smooth, homogeneous
Homogeneity	Good

2. **pH Determination:**
   Table 3 : Result of pH determination

S.No	Formulation	pH
1.	F1	4.0
2.	F2	3.71
3.	F3	4.2
4.	F4	4.47

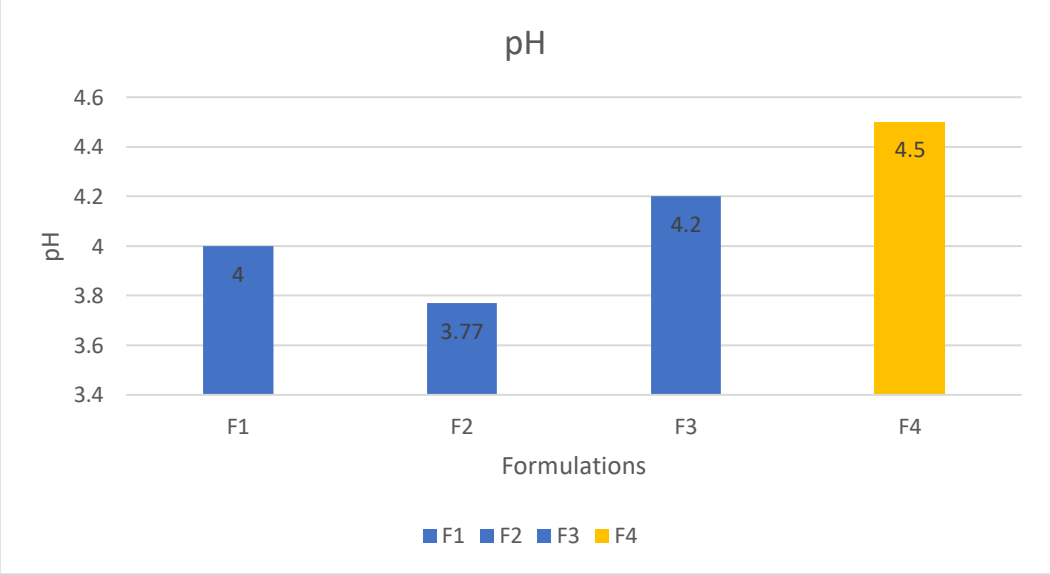

Figure 4 – Graphical representation of pH determination

3. Viscosity Determination:

Table 4: Result of viscosity determination

S.No	Formulation	Viscosity
1.	F1`	210.62 pa
2	F2	2226.79 pa
3.	F3	278.29 pa
4.	F4	311.93 pa

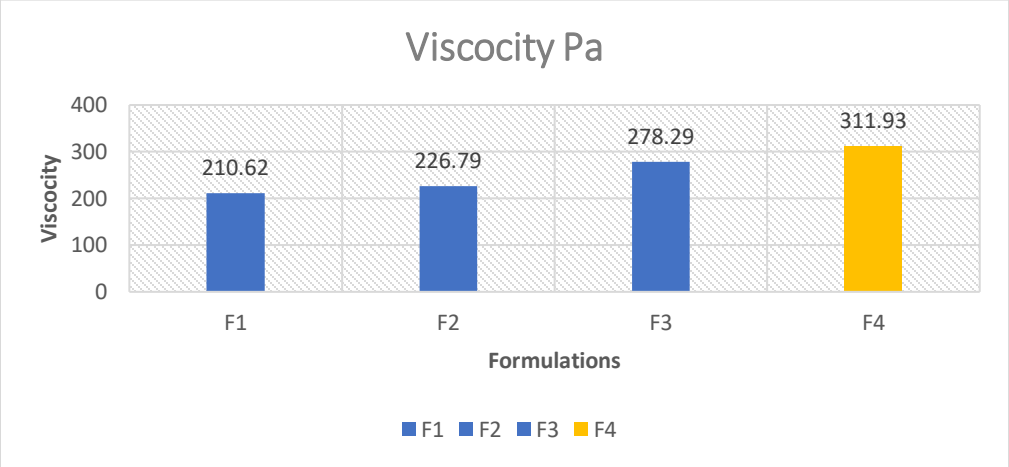

Figure 5: Graphical representation of viscosity determination

4. Globule Size Determination:

Table 5: Result of globule size determination

S.No	Formulation	Globule Size
1.	F1	0.3
2.	F2	0.5
3.	F3	0.2
4.	F4	0.1

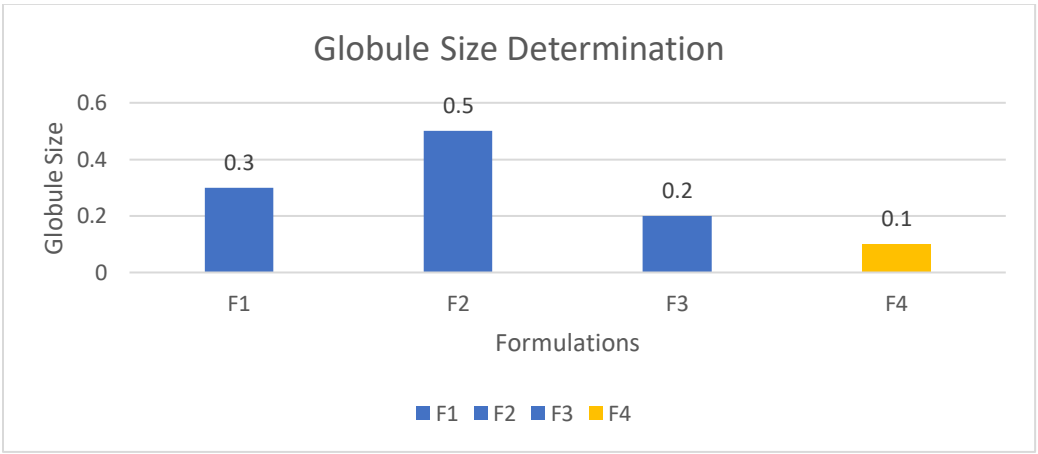

Figure 6: Graphical representation of globule size determination

5. Spreadability:
Spreadability of liquid formulation is the ability of the face serum to spread over the skin and play important role in administration of standard dose of medicament formulation on skin.

6. After Feel:
After application of serum, had a soothing, pleasant, and light effect as informed to us by the individuals, indicating that it had an emollient and moisturizing action.

CONCLUSION:

We have been able to successfully formulate face serum for topical application for pigmentation & acne against pigmentation & acne. Our face serum was prepared using salicylic acid & ascorbic acid along with additional excipients. 4 face serum formulations were prepared by varying the concentration of excipients. These prepared formulations were evaluated for physical parameters like: Appearance, Spreadability, pH, Viscosity, Homogeneity and Globule size.

Upon completing all the above evaluations it can be concluded that F4 is the optimized formulation as it shows ideal pH to the skin and globule size. With the right concentration of salicylic acid and ascorbic acid they act as potent , safe and effective face serum for pigmentation and acne.

REFERENCES:

1. Miss Telange-Patil P.V*, Miss.Bochare V.B, Miss.Padale A.H, Miss.Chavan R.S., "Formulation and Evaluation of Anti-Aging Face Serum Spray" , International Journal of Creative Research Thoughts (IJCRT), Volume 10, Issue 10 October 2022 | ISSN: 2320-2882.
2. Budiasih, S., Masyitah, I., Jiyauddin, K., Kaleemullah, M., Samer, A. D., Fadli, A., & Yusuf, E. (2018). Formulation and Characterization of Cosmetic Serum Containing Argan Oil as Moisturizing Agent. https://doi.org/10.5220/0008361702970304
3. Miss. Purva S Rajdev, Prof. Gaikwad S. D, Miss. Akanksha A Somvanshi ,Miss. Shubhangi S Gunjal., "Formulation and Evaluation of Face Serum", International Journal of Advanced Research in Science, Communication and Technology (IJARSCT), Volume 2, Issue 5, June 2022, ISSN 2581-9429.
4. Kanchan Chande, Sunidhi Dessai, Santosh Bhutekar, Md Talat Choudhary., "Formulation and Evaluation of Anti-Aging Serum", Journal of Emerging Technologies and Innovative Research (JETIR), February 2023, Volume 10, Issue 2, ISSN-2349-5162.
5. Atif T. Salicylic acid as a palling agent :a comprehensive review . chin comet Investing Dermatol 2015;26(8): 455-461
6. Benefits of salicylic acid in skin care posted by Rohit Gupta , Priti Talwar .(12 March 2022). The WWW.dermaco.com.
7. Lin A N, Nakatsui T. salicylic acid revisited Int J Dermatol. 1998;37:335.342
8. Medically reviewed by Minimalist Health Specialist .written by Vidhi Patel (Journalist) on third Dec 2020.
9. Traikovich, S.S. Use of Topical Ascorbic acid and its effects on Photo damaged skin topography. Arch. Otorhinol. Head Neck Surg. 1999, 125, 1091–1098
10. Colven, R.M.; Pinnell, S.R. Topical vitamin C in anging. Clin. Dermatol. 1996, 14, 227–234.
11. Ravetti S, Clemente C, Brignone S, Hergert L, Allemandi D, Palma S. Ascorbic Acid in Skin Health. Cosmetics. 2019; 6(4):58.
12. Ando H, Kondoh H, Ichihashi M, Hearing VJ. Approaches to identify inhibitors of melanin biosynthesis via the quality control of tyrosinase. J Invest Dermatol. 2007 Apr;127(4):751-61.
13. Lupo MP. 2005. Cosmeceut,ical peptides, Dermatol Surg, 31(2): 832–836.
14. Naveed. Akhtar, Mahmood Ahmad ,Gulfishan, MIrfan Masood and Mohammad .Aleem .Pak.J . pharma.sci, 2008 21(4) -430-437.
15. Asian Journal of pharmaceutical technology and Innovation .2017.
16. Ojha, Smriti & Sinha, Surabhi & Chaudhuri, Swadhapriya & Chadha, Hina & Aggarwal, Babita & Jain, Seema. (2019). Formulation and Evaluation of Face Serum containing Bee Venom and Aloe Vera Gel. World Journal of Pharmaceutical Research . Vol 8. Issue 2.