

SalSphere® Even Skin

Encapsulated Salicylic Acid to Fight Acne

UNIQUE DELIVERY TECHNOLOGY

SalSphere® Even Skin is a proprietary sub-micron sphere technology that delivers potent pharmaceutical-grade salicylic acid (30% wt) to fight acne, smooth the skin, unclog pores, eliminate sebum accumulation, and prevent new breakouts while being skin-friendly.

The tiny spheres technology is formulation-ready and easy to suspend in water. It's used to formulate emulsion-based facial formulations, such as washes, lotions, and serums.

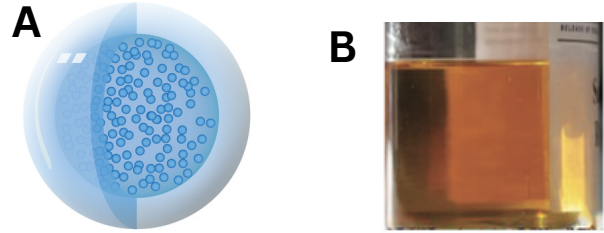


Fig 1: A; SalSphere Even Skin is based on a solid hydrophobic core encapsulating Salicylic Acid and a thin hydrophilic shell. B: The product is clear liquid gold color.

The Technology:

The core is made of natural lipids, enabling the sphere's targeted deposition to pimples (fat-to-fat, hydrophobic adhesion) and slowly releasing the acid. The shell enables suspending the lipid spheres in water and emulsion.



Fig 2: Before (A) and after (B) 7 days of treatment to reduce acne.



Fig 3: Before (A) and after (B) 7 days of treatment to reduce acne.



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Technical Data

The Value of using SalSphere Even Skin

Salicylic acid is a widely used ingredient in skincare, especially for treating acne and smoothing the skin.

Why Encapsulation?

On its own, Salicylic Acid presents technical challenges in formulating, including:

1. The solubility of salicylic acid in water is very low, so formulators use undesired alcohol or harsh ingredients to solubilize it into a formula.
1. Salicylic acid is a weak acid with a pKa of 2.97, meaning it will only partially ionize in water. At this pH, it may cause skin dryness and irritation. Titrating the low pH with NaOH shifts the acid to a salt (Sodium Salicylate), which is ineffective.

SalSphere encapsulation technology enables the easy formulation of various products, avoiding alcohol and harsh surfactants.

The encapsulated salicylic acid can be formulated at a skin-friendly pH, making it suitable for consumers with sensitive skin. The formulator can easily control the pH level by titrating about 2% of the leaking salicylic acid.

Time-release of salicylic acid means it is released in a small dosage over a longer time, reducing the immediate concentration on the skin, making it more skin-friendly.

INCI

Key INCI: Salicylic Acid, Arginine, Ceramide AP, Butyrospermum Parkii (Shea) Butter

Other: Isostearamidopropyl Ethyldimonium Ethosulfate, Polyglyceryl-4-Oleate, Propylene Glycol, Citric Acid

This product is preservative-free. Qualified as **Sephora Clean and China-compliant**

Characteristic	Specification
Appearance	Translucent to hazy
Form @RT	Liquid
Color	Light to dark amber
pH (1% in water)	2.5-3.5

Recommended shelf life:
24 months, air-tight at 25 degrees C

Unique Technology Features:

- Easy and fast to formulate into cosmetic emulsions, leaving no crystals
- Stable solution that guarantees long shelf life
- Safe and skin-friendly, potent solution at low concentrations reduces dryness and enhances compliance.



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Skin Testing

Skin pH:

The effect of SalSphere® Even Skin on the skin's pH (Hanna Skin pH meter) on the forearm of the volunteers (Fig 4). One arm was washed with a free salicylic acid, and the other was washed with the SalSphere® Even Skin (both used 2% salicylic acid).

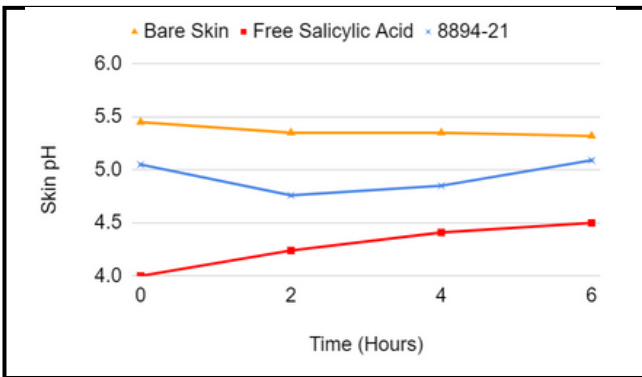


Fig 4: Washing with free salicylic acid (red line) dropped the pH to 4 and gradually increased to 4.6 over 6 hours. The skin treated with SalSphere® Even Skin (Blue line) showed a pH of 5.4 upon application; gradually, the pH dropped to 4.6 over 5 hours and was rebalanced.

SalSphere® Even Skin is a more skin-friendly solution. Salicylic acid's gradual release (time-release) drops the pH but keeps it in the friendly range.

Skin Exfoliation in -Vitro

Exfoliation was assessed by coloring the skin and using a Cutaneous Colorimeter before and after the wash with 2% Salicylic acid from SalSphere® Even Skin (Fig 5).

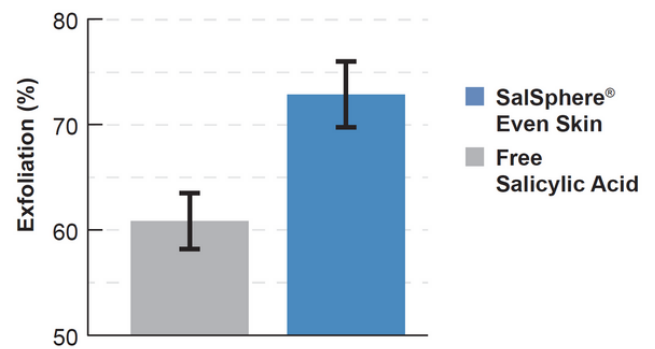


Fig 5: SalSphere® Even Skin provides a significant 20% increase in exfoliation compared with free salicylic acid (n=21).

Clinical Study

In the following study (fig. 2,3,6), panelists used a facial wash containing 2.0% Salicylic Acid (6.67% SalSphere® Even Skin) daily for 7 days. Pictures taken at time 0 and after 7 days.

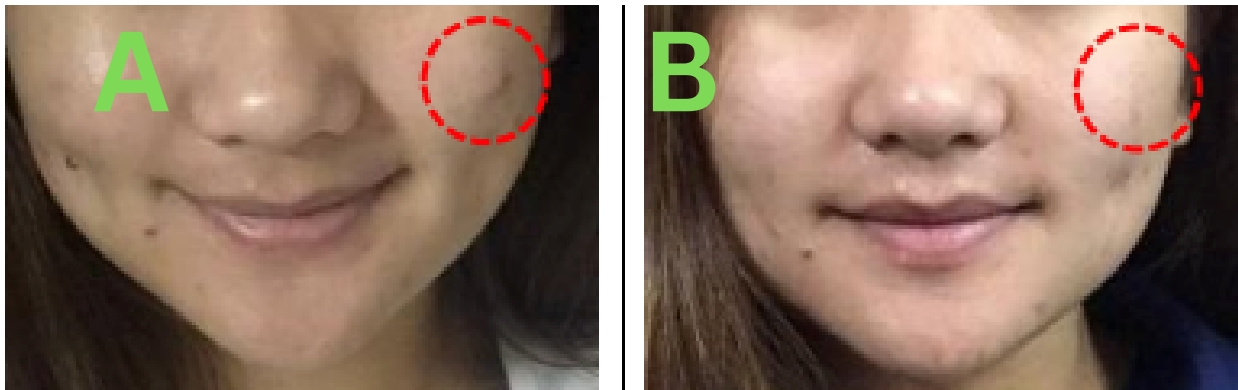


Fig 6: Volunteer 1: Before (A) and after (B) 7 days of treatment to reduce acne.



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Clinical Data

Anti Acne Efficacy

54.55% of Subjects Showed Improvement in Lesions (Average Reduction 5.16%)

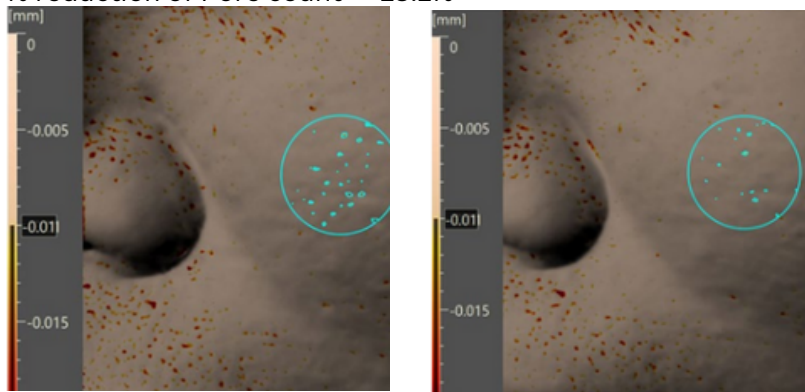
Pore Size Reduction for Skin Smoothing

When Compared to the Cream Base (Statistically Significant)

% reduction of Total pore volume = -28.3%

% reduction of Total pore area = -28.6%

% reduction of Pore count = -18.1%



t= 0 weeks

t= 4 weeks

Non Comedogenic

Salsphere Even Skin was also found to be non-comedogenic”

This is due to reduction of inflammatory lesions

Tendency to Improve Skin Whitening

“Salsphere Even Skin shows a tendency to improve skin whitening effect”

63.6% of Subjects saw improvement in Skin Whitening (L* Parameter)

Major Claims

- Anti Acne Efficacy
- Pore Size Reduction for Skin Smoothing
- Non Comedogenic
- Tendency to Improve Skin Whitening

Scope of Study

SalSphere Even Skin was used at 6.67% in Cream Base (2% Salicylic Acid)

Testing Methods

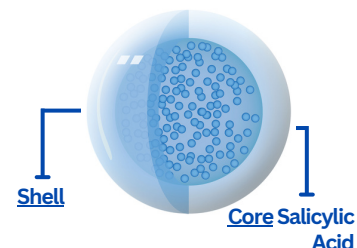
Antera 3D® CS is a camera developed by Miravex Limited to acquire images in three dimensions for analysis and to measure topographic features of the skin. Dermatologist evaluation was also used.

Third party clinical testing was conducted by DermaProof Asia





Unique&Easy Micro-Encapsulation Solutions



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Applications

Cream with SalSphere® Even Skin

INCI	Weight (%)
Water	55
Glycerin	6
Xanthan Gum	1
Cetearyl Alcohol (and) Cetearyl Glucoside	4
Coco Glucoside	4
Cetearyl Alcohol	6
Butyrospermum Parkii (Shea) Butter	6
Isononyl Isononanoate	6
Squalane	6
SS ES (8894-21)	5
Preservative	1
TOTAL	100

Compatibility with Thickeners:

SalSphere® Even Skin is compatible with thickeners such as Xanthan and Guar Gum. When using a thickener such as Carbomer, SS ES should be mixed with a solubilizer such as Polysorbate before the addition of the carbomer solution and pH adjustment

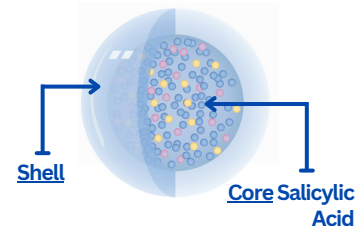
INCI	Weight %
Aqua	89.7
Carbomer	0.8
Polysorbate 80	0.5
SalSphere® Even Skin 8894-21	5
Propanediol	3
Triethanolamine	1

Face Mask with SalSphere® Even Skin

SalSphere® Even Skin (SS ES) can be combined with other technologies such as SalColor FX, to emphasize the usage and efficacy of the products including face masks

INCI	Weight(%)
Water	67.67
Xanthan Gum	0.5
Glycerin	3
Kaolin	5
Bentonite	3
Polymethylsilsesquioxane/ silica crosspolymer	2
Glyceryl Stearate (and) PEG 100 Stearate	4
Capric/Caprylic Triglycerides	3
Cetyl Alcohol	2
Synthetic Wax (and) Titanium Dioxide (and) Isopropyl Titanium Triisostearate	1
Stearic Acid	2
Dimethicone (and) Polysilicone-11 (and) Butyrospermum Parkii (Shea) butter	2.5
SS ES (8894-21)	3.33
Phenoxyethanol and Exthylhexylglycerin	1
TOTAL	100





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Claim Support

Main benefit of the technology

SalSphere® Even Skin is a delivery system for a blend of salicylic acid and arginine to provide the benefit of improving and rejuvenating skin conditions in a less irritating and time-released formulation.

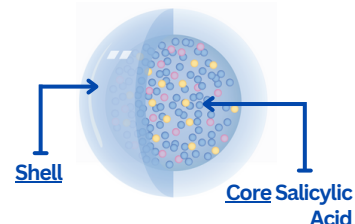
Additional claims and unique features

- Helps to unblock and clean pores to combat acne
- Reduces sebum production of the skin to combat acne
- Exfoliates the skin with no to minimal irritation
- Helps to improve skin tone and smoothness
- Minimal to no irritation or skin barrier damage
- Time-released and long-lasting
- Easy to formulate

References

1. Tsai, Thomas & BS, & Hantash, Basil. (2008). Cosmeceutical Agents: A Comprehensive Review of the Literature. Clinical Medicine Insights : Dermatology.
2. Arif, T. (2015). Salicylic acid as a peeling agent: a comprehensive review. Clinical, Cosmetic and Investigational Dermatology, 455. doi:10.2147/ccid.s84765
3. Saint-Léger, D., Lévêque, J.-L., & Verschoore, M. (2007). The use of hydroxy acids on the skin: characteristics of C8-lipo-hydroxy acid. Journal of Cosmetic Dermatology, 6(1), 59–65. doi:10.1111/j.1473-2165.2007.00296.x
4. Bissett, D. L. (2009). Common cosmeceuticals. Clinics in Dermatology, 27(5), 435–445. doi:10.1016/j.clindermatol.2009.05.006
5. Chen, Y.-Y., Lu, Y.-H., Ma, C.-H., Tao, W.-W., Zhu, J.-J., & Zhang, X. (2017). A novel elastic liposome for skin delivery of papain and its application on hypertrophic scar. Biomedicine & Pharmacotherapy, 87, 82–91. doi:10.1016/j.biopha.2016.12.076





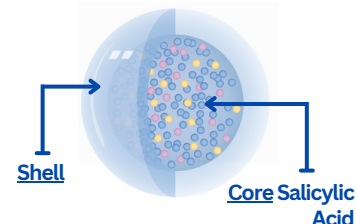
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Claim Support

Claims	Literature Substantiation
Helps to unblock and clean pores to combat acne	“SA is most commonly employed in the treatment of acne, where its lipophilicity allows penetration into the pore and subsequent exfoliation of dead skin; excess oil build up is also diminished. Numerous studies have shown that SA decreases follicular plugging and progression to inflammatory acne lesions.” [1]
Reduces sebum production of the skin to combat acne	“[Salicylic acid] also decreases secretion of sebum in patients with acne, which adds to its therapeutic effect in these patients. Marczyk et al studied the effect of 50% pyruvic acid and 30% SA peels on skin lipid film in patients with acne vulgaris, and concluded that SA had a greater sebometric effect than pyruvic acid.” [2]
Exfoliates the skin with no to minimal irritation	<p>“It has been found that SA, being an organic acid, extracts desmosomal proteins including desmogleins. As a result of this action, the cohesion of epidermal cells is lost, leading to exfoliation...Imayama et al studied histological changes in the skin... [and] concluded that peeling with SA can lead to alterations in the underlying dermal tissue without directly wounding the skin.” [2]</p> <p>“...creams containing 2% SA or C8-LHA were found to enhance the shedding of corneocytes and reduce the thickness of the stratum corneum. Ultrastructural studies of the skin show that hydroxy acids target in particular the central desmosomes in the stratum disjunctum, resulting in a reduced coherence between the layers of corneocytes but leaving the corneocytes in sheets. The penetration of SA and the AHAs is relatively rapid and consequently the breakdown of central corneosomes occurs throughout the stratum corneum.” [3]</p>
Helps to improve skin tone and smoothness	<p>“Taking salicylic acid as an example, human testing on forearm skin (dansyl chloride method) reveals increased stratum corneum turnover with topical 1.5% salicylic acid of 18.5 days vs 21.5 days for the vehicle control. More rapid turnover leads to improvement in facial skin smoothness and color as assessed by test volunteers themselves and by image analysis and expert grader assessment.” [4]</p> <p>“SA also has been shown to protect against ultraviolet (UV) B radiation and photoaging, as well as improve the appearance of photo-induced skin dyspigmentation. In a study of 268 patients, weekly facial peels of SA 30% used for 8 weeks improved the appearance of melasma, post-acne scars, post-inflammatory hyperpigmentation (PIH), fine lines and wrinkles.” [1]</p> <p>“The capacity of the hydroxy acids to stimulate the division and maturation of keratinocytes has been suggested for a number of years...It now seems more certain that the effect of low concentrations of hydroxy acids does not evoke an inflammatory response and indeed SA may even be anti-inflammatory. In animal models, topically applied GA and SA have been found to increase epidermal cell division and in some experiments, a wave of cell proliferation has been observed 12–16 h after topical application.” [3]</p>





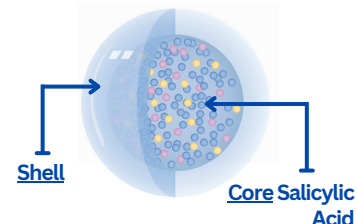
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Claim Support

Claims	Literature Substantiation
Minimal to no irritation or skin barrier damage	<p>“Taking salicylic acid as an example, human testing on forearm skin (dansyl chloride method) reveals increased stratum corneum turnover with topical 1.5% salicylic acid of 18.5 days vs 21.5 days for the vehicle control...No significant redness or TEWL changes were associated with the salicylic acid treatment.” [4]</p> <p>“[Salicylic acid] is lipophilic and easily enters the epidermis and membrane of adnexal structures such as sebaceous glands via hair follicle pores...The lipophilic nature of SA helps limit its clinical effect to the superficial epidermis leading to fewer side effects in comparison to α-hydroxy acids, which penetrate deeper into the dermis.” [1]</p>
Time-released and long lasting	In vitro tests on porcine skin show that SalSphere® Even Skin maintains salicylic acid on skin for a longer duration than unencapsulated salicylic acid
Easy to formulate	Stability and compatibility tests: SalSphere® Even Skin added to lotion, serum, and wash bases remain stable for up to and beyond 3 months @42C.
Arginine for Skin Care	<p>“Arginine is an amino acid naturally present in the body, considered essential to human development. As a skin care ingredient, it delivers antioxidant benefits and plays a role in repairing visible skin damage. Additionally, arginine’s hydration properties have been studied in depth. This essential amino acid plays a key role in skin’s natural production of replenishing substances such as proline and urea.”</p> <p>https://www.paulaschoice.com/ingredient-dictionary/ingredient-arginine.html</p>





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Claim Support

Application, claim	Reference
Chemical peeling is a safe, efficacious, and cost-effective procedure for treating various skin disorders and for enhancing cosmetic appearance.	Salicylic acid as a peeling agent: a comprehensive review Tasleem Arif, Clinical, Cosmetic, and Investigational Dermatology Volume 8, 2015
Peeling with SA can lead to alterations in the underlying dermal tissue without directly wounding the skin	ImayamaSUedaSIsodaMHistologic changes in the skin of hairless mice following peeling with salicylic acidArch Dermatol20001361390139511074703 [Crossref], [Web of Science ®], [Google Scholar]
SA also has anti-inflammatory properties. The concentration at which the anti-inflammatory action of SA is most pronounced is between 0.5% and 5% (w/w)	BurkeASmythEFitzgerald GarretAAAnalgesic antipyretic and anti-inflammatory agentsBruntonLLLazoJSParkerKGoodman and Gilman's The Pharmacological Basis of Therapeutics11th edNew York, NY, USAMcGraw-Hill2006 [Google Scholar]
Salicylates and their derivatives have been used in sunscreen formulations. The aromatic benzene ring in the salicylate converts ultraviolet radiation into longer wave radiation that is felt as heat, which explains the mechanism of action in sunscreen preparations.	AdamBHJulioCCDanaMKAndrewNLAagents used for treatment of hyperkeratosisWolvertonSEComprehensive Dermatologic Drug Therapy3rd edNew York, NY, USAElsevier Saunders2013 [Google Scholar]
SA also has antimicrobial and antifungal properties. Whitfield's ointment, which contains benzoic acid and SA, has been used for its antifungal properties.	AdamBHJulioCCDanaMKAndrewNLAagents used for treatment of hyperkeratosisWolvertonSEComprehensive Dermatologic Drug Therapy3rd edNew York, NY, USAElsevier Saunders2013 [Google Scholar]
50% SA ointment paste containing buffered methyl salicylate and croton oil for the treatment of actinically damaged skin, lentigines, and pigmented keratosis on the forearms and dorsal aspect of the hands, and reported excellent results.	SwinehartJMSalicylic acid ointment peeling of the hands and forearms. Effective nonsurgical removal of pigmented lesions and actinic damageJ Dermatol Surg Oncol1992184954981534332 [Crossref], [Google Scholar]
SA peels are a good therapeutic option for comedonal acne , and can be a good adjunctive modality for treating open and closed comedones, post-acne erythema, and hyperpigmentation .	MonheitGDChastianMAChemical and mechanical skin resurfacingBolognaJLJorizzoJLRapiniRPDermatologyPhiladelphia, PA, USAMosby2003 [Google Scholar]
The efficacy of SA in the treatment of photoaging and acne has been described in patients with Fitzpatrick skin types I-III as well as in skin types V and VI.	BourellyPELotsikas-BaggiliAJChemexfoliation and superficial skin resurfacingBurgessCMCosmetic Dermatology1st edHeidelberg, GermanySpringer-Verlag2005 [Crossref], [Google Scholar]
Improvement in surface roughness and pigmented lesions, along with a reduction in fine lines .	KligmanDKligmanAMSalicylic acid peels for the treatment of photoagingDermatol Surg1998243253289537006 [Crossref], [Web of Science ®], [Google Scholar]