



Multifruit[®] BSC
The Natural Source for AHAs

Cosmetic Ingredients & Ideas[®]
BROOKS
INDUSTRIES INC.

AT THE LEADING EDGE OF COSMETIC TECHNOLOGY

Cosmetic Properties

Characteristics

- Natural source of AHAs from botanical extracts
- Maximum efficacy with minimum irritancy
- 55% active at a pH ~ 4.0
- Clear solution, low odor

Uses

- Recommended use levels 5.0 -- 15.0%
- Safely exfoliates dead skin cells
- Stimulates skin cell renewal

Multifruit® BSC The Natural Source for AHAs

Multifruit® BSC is a concentrated blend of five botanical extracts: bilberry, sugar cane, sugar maple, orange, and lemon. These extracts contain several naturally occurring alpha hydroxy acids. Alpha hydroxy acids have been shown to promote smoother, younger looking skin by increasing the rate of cell renewal.

Alpha hydroxy acids (*AHAs*) have been used in skin care for many years. At first, they were used mainly by dermatologists as skin peeling and moisturizing agents. It is only recently that cosmetic companies have “discovered” AHAs and their almost miraculous activity. Since that “discovery”, many companies have introduced AHA products to their skin care lines.

Multifruit® BSC is produced by taking several species of plants and running them through an exhaustive extraction process, which reduces color, odor, and concentrates the active principles. The extracts are blended at the following percentages:

Bilberry	57.00%
Sugar Cane	24.00%
Sugar Maple	3.00%
Orange	8.00%
Lemon	8.00%

Once blended, the extracts are concentrated by vacuum distillation until a specified concentration of actives is achieved. The product is then filtered to eliminate any particulate matter. Since **Multifruit® BSC** is a natural



product it will contain a wide variety of residual natural substances, such as cellulose, carbohydrates, proteins, water soluble vitamins and minerals.

When the process is complete, the material contains the following concentrations of alpha hydroxy acids:

Lactic Acid	28-32%
Glycolic Acid	12-17%
Citric Acid	2-6%
Malic Acid	1% max
Tartaric Acid	1% max

The primary action of AHAs lies in their keratolytic ability – they weaken bonds that hold dead skin cells together. When these bonds are weakened, the dead cells can be shed from the surface of the skin, resulting in skin that appears fresher, smoother, and younger.

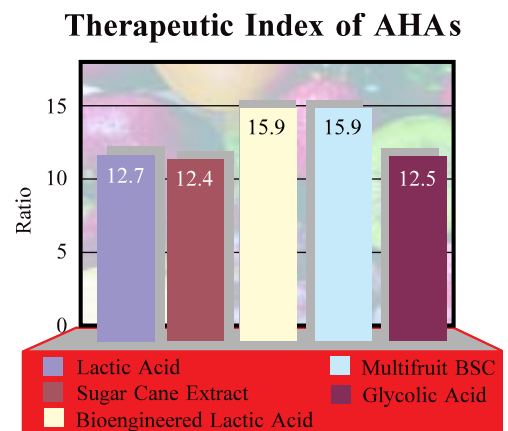
Although the keratolytic activity of AHAs is very important, it is also interesting to note that many AHAs function as intermediates in several key metabolic pathways. Glycolysis, a process which involves the oxidation of glucose to pyruvic acid, is a key pathway of the cellular energy process. Hydrolysis of pyruvic acid leads to the formation of lactic acid. Lactic acid is a highly effective moisturizer. In studies, it has been shown to increase the synthesis of glycosaminoglycans. Glycolic acid exhibits the most keratolytic ability of any of the AHAs. It is glycolic acid that is responsible for the immediate skin softening effect felt by consumers when they first use an AHA product. Citric acid, when topically applied, stimulates collagen synthesis. Both tartaric and malic acid boost skin elasticity. To combine all of these AHAs results in a truly multifunctional material.



Natural Versus Synthetic Alpha Hydroxy Acids

The debate over natural versus synthetic AHAs has raged for several years. With the advent of **Multifruit® BSC**, it seems that we have combined natural purity with excellent activity. Walter Smith of Walter Smith Consultants has published a study showing the therapeutic indices of synthetic and natural AHAs. Basically, the therapeutic index is the ratio of stimulation to irritation. AHAs, since they are acids, have a potential to be irritating to the skin. However, their irritation potential is coupled with the ability to stimulate cell renewal. His findings are summarized in the graph. The results show that the activity of **Multifruit® BSC** surpasses the activity of

the synthetic lactic and glycolic acids. In **Multifruit® BSC**, we have maximized the ability to stimulate cell renewal, while minimizing the potential for irritation.



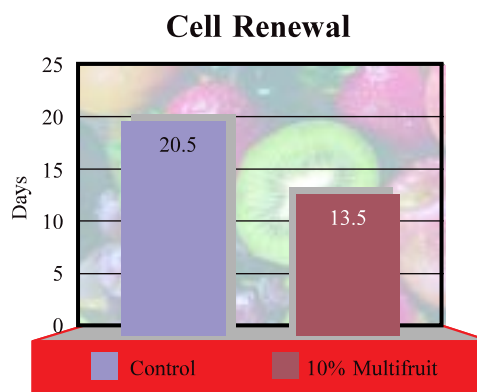
Efficacy Studies

Multifruit[®] **BSC** was evaluated in aqueous solution and in a commercial cosmetic cream. Both tests were conducted via a dansyl chloride protocol. Panelists were patched for 24 hours with 5% dansyl chloride in a petrolatum base. All subjects were examined on Day One with quartz mineral UV lamps (*long and short wave*) to ensure that the fluorescent stain had been taken up by the stratum corneum layers. Material was applied to sites on the volar forearm.

At a 10% dilution, **Multifruit**[®] **BSC** produced a 34% increase in cell renewal when compared to the untreated control site. Accordingly, there was a 143% increase in the number of squames generated. Evaluated at 4% in a commercial cream, **Multifruit**[®] **BSC** in-

creased cell turnover by 20% relative to the control formulation.

The graph below shows that it took almost twice as long for the untreated control to remove all of the dansyl chloride as it did for the 10% **Multifruit**[®] **BSC**. This correlates with **Multifruit**[®] **BSC**'s ability to stimulate cell renewal.



Formulating Tips

Multifruit[®] **BSC** is freely soluble in water, glycerine, and propylene glycol. It is immiscible with commonly used cosmetic oils.

- Add **Multifruit**[®] **BSC** at the end of the procedure.
- Some formulations containing polymers such as Carbopol require that the **Multifruit**[®] **BSC** be pre-diluted and/or neutralized.
- Always check compatibility with clays and other inorganic thickeners.

The best formulations for **Multifruit**[®] **BSC** are nonionic creams and lotions.

Formula F12A7

Facial Cleanser with Fruit Acids

This cleanser formulation utilizes **Multifruit® BSC** to aid in the exfoliation of dead skin cells. The basic cleanser is a mild formulation utilizing **Foam-Soy CLS**, a low salt coco-hydrolyzed soy protein, for mildness and **Solu-Silk Protein** for moisturization. The extracts of the North American Botanicals: **Yucca Glauca**, **Jewelweed**, and **Spotted Geranium** provide soothing effects, while **Queen of the Prairie** contributes salicylates which aid exfoliation and cell renewal.

Ingredients	Nomenclature	Source	%
Demineralized Water	Water		QS
Polymer JR 400	Polyquatrnium-10	15	0.25
Standamid KD	Cocoamide DEA	3	3.00
Cerasynt IP	Glycol Stearate & Other Ingredients	4	1.00
Standapol EA-40	Ammonium Laureth Sulfate	3	12.00
Germaben II	Propylene Glycol & Diazolidinyl Urea & Methylparaben & Propylparaben	5	1.00
Foamtaine CAB	Cocamidopropyl Betaine	6	7.50
Solu-Silk Protein	Hydrolyzed Silk	1	1.00
Foam-Soy CLS	AMP Coco-Hydrolyzed Soy Protein	1	5.00
NAB Yucca Glauca	Yucca Glauca Extract	1	1.00
NAB Jewelweed	Water & Garden Balsam		
	Impatiens Balsamina Leaf Extract	1	1.00
NAB Spotted Geranium	Water & Geranium Maculatum Extract	1	1.00
NAB Queen of the Prairie	Water & Spiraea Ulmaria		
	(Meadowsweet) Extract	1	1.00
Multifruit® BSC	Water & Vaccinium Myrtillus Extract & Saccharum Officinarum (Sugar Cane) Extract & Acer Saccharinum (Sugar Maple) Extract & Citrus Aurantium Dulcis (Orange) Fruit Extract & Citrus Medica Limonum (Lemon) Extract	1	1.00
Fragrance	Fragrance		QS
0.1% D&C Orange 4	D&C Orange No. 4		0.50
0.1% D&C Red 40	D&C Red No. 4		0.15

Procedure

1. Dissolve the Polymer JR in the water while heating to 75°C.
2. Add the Standamid KD and the Cerasynt IP to the batch and mix until melted and fully dispersed.
3. Remove from heat source and slowly add the Standapol, Foamtaine, and **Foam-Soy CLS**. Mix until uniform.
4. Cool to 50°C and add the Germaben and the **Solu-Silk Protein**, mixing well between each addition.
5. At 35°C, add the **NABs**, **Multifruit® BSC** and colors.

Extra Strength Fruit Acid Cream II

Multifruit® BSC is used in this elegant cream based on powerful non-ionic emulsifying waxes (**Brookswax P & Brookswax D**) and utilizing our **Liquiwax DIADD** to provide elegance and cushion without imparting either greasiness or oiliness. **Ivarbase 3210** is used to enhance penetration. The formula integrity is protected by **Myavert® C**, a novel enzymatic antioxidant system.

Ingredients	Nomenclature	Source	%
Multifruit® BSC	Water & <i>Vaccinium Myrtillus</i> Extract & <i>Saccharum Officinarum</i> (Sugar Cane) Extract & <i>Acer Saccharinum</i> (Sugar Maple) Extract & <i>Citrus Aurantium Dulcis</i> (Orange) Fruit Extract & <i>Citrus Medica Limonum</i> (Lemon) Extract	1	12.00
Gelwhite GP	Montmorillonite	9	0.25
Demineralized Water	Water		71.20
Brookswax P	Emulsifying Wax	1	2.00
Brookswax D	Cetearyl Alcohol & Cetareth 20	1	2.00
GMS 165	Glyceryl Stearate & PEG – 100 Stearate	2	1.00
Cetyl Alcohol	Cetyl Alcohol	2	1.50
Liquiwax DIADD	Dioctyldodecyl Dodecanedioate	2	5.00
Finsolv TN	C 12-15 Alcohol Benzoate	11	1.00
Ivarbase 3210	Cetearyl Alcohol & Acetylated Lanolin Alcohol	1	1.00
Ivarlan 3310	Lanolin Alcohol	1	1.00
Lipo GMS 450	Glyceryl Stearate	10	2.00
Fomblin® HC/04 Emulsion	Perfluoropolymethylisopropyl Ether & Glycerin & Sodium Lauryl Sulfate	1	0.20
Acqua-Biomin® Silicon Y3	Yeast Extract	1	0.50
Myavert® C	Glucose & Glucose Oxidase & Lactoperoxidase	2	1.05

Procedure

1. Disperse Gelwhite in batch water with fast prop agitation while heating to 70° C.
2. Heat oil phase ingredients to 70° C and add water phase with rapid prop agitation. Mix until uniform.
3. Cool to 35° C and add **Multifruit® BSC** with prop agitation. Mix well.
4. Add **Acqua-Biomin® Silicon Y3**.
5. Add **Fomblin® HC/04 Emulsion**.
6. Add 0.05% **Myavert® A** (*enzyme*) and 1.0% **Myavert® B** (*substrate*) and mix well.
Note: **Myavert® C** is a binary system composed of **Myavert® A & B**. Do not premix **Myavert® C**.
7. Adjust pH to 4.0 - 5.0 as required.

Fomblin® is a registered trademark of Ausimont. Distributed in North America by **Brooks Distribution Inc.**

Myavert® C is a trademark of BASF. Distributed in the US by **Brooks Distribution Inc.**

Sources

1. **Brooks Industries Inc.**
2. **Brooks Distribution Inc.**
3. Henkel, Inc.
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