Modern peeling solutions
from leave-on to rinse-off

InCosmetics Barcelona 2015
Florence Olechowski,
R&D Manager Cosmetics
Modern peeling solutions from leave-on to rinse-off

Agenda

1. Exfoliation

2. Berg-Schmidt, modern solutions
   a. GlyAcid®
   b. BergaScrub

3. Formulation concepts
Modern peeling solutions from leave-on to rinse-off

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1. Exfoliation

2. Berg-Schmidt, modern solutions?
   a. GlyAcid®
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Exfoliation

Peeling is THE current trend
In the last few months peeling has been everywhere!
Modern peeling solutions from leave-on to rinse-off

Exfoliation

What is skin exfoliation?
Removal of the uppermost layer of the skin (dead skin cells, dirt, fat and debris)

Fig 1: Skin structure
Why exfoliate\(^1\)?

- To give skin a smooth texture, healthy tone and beautiful glow
- To prevent skin congestion and fight premature aging by helping accelerate the regeneration of healthy skin cells.
- To get a soft, smooth skin feel.
- To get better looking skin texture and even tone.
- To reduce the appearance of fine lines and wrinkles.
- May help increase the skin penetration of skin care ingredients.
- Improves the color quality and uniformity of sunless tanning products.
- Increases cell turnover.
- May induce the release of cytokines, which promote the production of collagen, elastin, and hyaluronic acid.

\(^1\) Source UL Prospector
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Exfoliation

**Enzyme peels**
Very soft action, efficacy
*Papaya, pineapple…*

**Chemical peels**
Act on the lipids in the upper layer
*Alpha- and beta-hydroxy acid (resp. AHA, BHA)*

**Mechanical peels**
Physical friction on the skin to slough off dead skin cells
*Beads, kernel pieces…*
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GlyAcid®, glycolic acid revival

What is glycolic acid?
Glycolic acid is the simplest of the alpha hydroxy acids (AHA)
A very small molecule with high penetration ability
One of the most active chemical peeling molecules on the market

pH in Water: EXTREMELY low

Fig 2: Glycolic acid molecular structure
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GlyAcid®, glycolic acid revival

Benefits of glycolic acid

- **Acne scars**: Helps reduce hypertropic scars by flattening them
- **Ingrown hairs**: Prevents the skin from covering the pore and trapping the hair before it grows back
- **Skin texture**: Removes dead skin cells, opens clogged pores, helps prevent blackheads and pimples
- **Anti-wrinkles**: Speeds skin cell turnover, stimulating production of elastin and collagen
- **Skin tone**: Minimizes dark spots
- **Nail care**: Softens cuticles, healthier looking nails
- **Hair care**: Improves manageability and strengthens the hair
Modern peeling solutions from leave-on to rinse-off

GlyAcid®, glycolic acid revival

Modern solution?
Glycolic acid has been well known for over 40 years

Predominant manufacturing process:
Carbonylation of formaldehyde or with glycolonitrile as a starting material
→ residual traces or release of formaldehyde in the finished commercial product

GlyAcid®
Saponification and purification process
→ high purity glycolic acid free of formaldehyde and other harmful impurities
**Modern peeling solutions from leave-on to rinse-off**

**GlyAcid®, glycolic acid revival**

**Products:**

<table>
<thead>
<tr>
<th>Product</th>
<th>Total acid %</th>
<th>State</th>
<th>Formaldehyde mg/kg</th>
<th>Formic Acid %</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>GlyAcid® 70 HP</td>
<td>70-72</td>
<td>liquid</td>
<td>undetectable*</td>
<td>undetectable*</td>
<td>250kg drums or 25kg pails</td>
</tr>
<tr>
<td>GlyAcid® 99 HP</td>
<td>min 90</td>
<td>crystals</td>
<td>undetectable*</td>
<td>undetectable*</td>
<td>20kg pails</td>
</tr>
</tbody>
</table>

* *Analytical method WQTM-08 with HPLC and UC/VIS detector*
Modern peeling solutions from leave-on to rinse-off
GlyAcid®, glycolic acid revival

Advantages at a glance

Recognized very high effectiveness
Various applications possible
Large amount of literature available
High purity – free of formaldehyde and formic acid
Modern peeling solutions from leave-on to rinse-off

Exfoliation

Structure of hair

Hair shaft: three layers

- Medulla: Innermost layer
  (not found in all hairs)

- Cortex: Middle layer
  Gives hair structure, colour (pigment: melanin),
  texture (strength and stretching), size

- Cuticle: Outermost layer, transparent, protects the
cortex from damage, responsible for visual attributes
  (shine, smoothness, manageability)
**Modern peeling solutions from leave-on to rinse-off**

**Exfoliation**

Glycolic acid role for the Hair?

- Natural pH of hair and scalp about 4.5 to 5.5
  - Natural protection against fungi and bacteria
  - Keep the cuticles closed and healthy.

- Glycolic acid is the smallest AHA
  - Able to penetrate the hair shaft and attach itself to the keratin proteins

**Fig 4: Healthy and damaged hair representation**

- Healthy hair:
  - Closed cuticles
  - Shiny, glossy, manageable, able to retain moisturizing and keep cortex safe

- Damaged hair:
  - Cuticles open or even missing
  - No shine, difficult to comb, keeps dirt & impurities (even cortex damage)
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BergaScrub, ecological and economical exfoliating beads

Microplastic beads
The most commonly used exfoliating beads until…
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BergaScrub, ecological and economical exfoliating beads

Modern solution?
For a few months the cosmetic market has been looking hard for alternatives
Modern peeling solutions from leave-on to rinse-off
BergaScrub, ecological and economical exfoliating beads

Products:

BergaScrub 400 and BergaScrub 350

Acid value   \( \leq 3 \text{ mg KOH/g} \)
Iodine value   \( \leq 3 \text{ g I}_2 /100\text{g} \)
Gardner colour \( \leq 3 \)
Melting point   \( \geq 84^\circ\text{C} \)
Density   \( 0.98 \text{ g/mL} \)

Packaging   \( 15\text{kg bags} \)
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BergaScrub, ecological and economical exfoliating beads

Long term abrasive performances:

After one year in the FJO K0083 surfactants system, BergaScrub 350 kept its form and hardness → retained its exfoliation properties.

Fig 5: Comparison of BergaScrub 350 in FJO K083 directly after manufacturing and after one year at room T°C
Modern peeling solutions from leave-on to rinse-off
BergaScrub, ecological and economical exfoliating beads

Modern solution
BergaScrub range, technical arguments

- High melting point
- Long term abrasive performance
- Ideal density for an easy suspension
- Smooth but not perfectly flat surface
  → Painless but effective exfoliation
Modern peeling solutions from leave-on to rinse-off

**BergaScrub**, ecological and economical exfoliating beads

**Modern solution**
BergaScrub range marketing arguments

- Readily biodegradable (OECD Guidelines for testing of chemicals)
- Natural, ecologically sound, renewable, non-GMO
- No competition with food for availability
- Compliant with ECOCERT and COSMOS cosmetic standards
- Competitive
- No additives, clean INCI name
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Formulation concepts

Mens facial cleanser pre-shave with 3% GlyAcid®

<table>
<thead>
<tr>
<th>Phase</th>
<th>Product</th>
<th>INCI Name</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Sodium Laureth Sulfate</td>
<td>Sodium Laureth Sulfate</td>
<td>8,0</td>
</tr>
<tr>
<td></td>
<td>Sodium Cocoaphoacetate</td>
<td>Sodium Cocoaphoacetate</td>
<td>4,0</td>
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<tr>
<td></td>
<td>Decyl Glucoside</td>
<td>Decyl Glucoside</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>PEG-200 Hydrogenated Glyceryl Palmitate</td>
<td>1,0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Propylene Glycol (and) PEG-55 Propylene Glycol Oleate</td>
<td>0,3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EDTA</td>
<td>Tetrasodium EDTA</td>
<td>0,1</td>
</tr>
<tr>
<td></td>
<td>demin. Water</td>
<td>Aqua</td>
<td>up to 100</td>
</tr>
<tr>
<td>B</td>
<td>GlyAcid® 70 HP</td>
<td>Glycolic Acid (and) Water</td>
<td>4,3</td>
</tr>
<tr>
<td></td>
<td>NaOH</td>
<td>Sodium Hydroxide</td>
<td>up to desired pH</td>
</tr>
<tr>
<td>C</td>
<td>Preservative/Fragrance</td>
<td>-</td>
<td>q.s.</td>
</tr>
</tbody>
</table>
### Modern peeling solutions from leave-on to rinse-off

Formulation concepts

**Micellar Water with GlyAcid®**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Product</th>
<th>INCI Name</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>demin. Water</td>
<td>Aqua</td>
<td>up to 100</td>
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<tr>
<td></td>
<td>MinaCare Pentiol³</td>
<td>Pentylene glycol</td>
<td>1,0</td>
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<tr>
<td></td>
<td>Glycerin</td>
<td>Glycerin</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Decyl Glucoside</td>
<td>Decyl Glucoside</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>Disodium Cocoamphodiacetate</td>
<td>Disodium Cocoamphodiacetate</td>
<td>2,0</td>
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<tr>
<td></td>
<td>Neodermyl ®²</td>
<td>Glycerin (and) Water (and) Methylglucoside Phosphate (and) Copper Lysinate/Prolinate</td>
<td>1,0</td>
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<tr>
<td></td>
<td>Avena Sativa (Oat) Extract</td>
<td>Water (and) Avena Sativa (Oat) Extract</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>EDTA</td>
<td>Tetrasodium EDTA</td>
<td>0,1</td>
</tr>
<tr>
<td>B</td>
<td>GlyAcid® 70 HP¹</td>
<td>Glycolic Acid (and) Water</td>
<td>4,3</td>
</tr>
<tr>
<td></td>
<td>NaOH</td>
<td>Sodium Hydroxide</td>
<td>up to desired pH</td>
</tr>
<tr>
<td>C</td>
<td>Preservative/Fragrance</td>
<td>-</td>
<td>q.s.</td>
</tr>
</tbody>
</table>

Suppliers:
¹ Crosschem distributed by Berg + Schmidt
² Induchem
³ Minnasolve
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Formulation concepts

Si/W cream with GlyAcid®

<table>
<thead>
<tr>
<th>Phase</th>
<th>Product</th>
<th>INCI Name</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>BergaBest GS SE(^1)</td>
<td>Glyceryl Stearate</td>
<td>3,5</td>
</tr>
<tr>
<td></td>
<td>Vegerol 1618 50:50(^1)</td>
<td>Cetearyl Alcohol</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Carbopol Ultrez 30(^3)</td>
<td>Carbomer</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>Ceteareth 20</td>
<td>Ceteareth 20</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>MicroCare M8100(^4)</td>
<td>Caprylyl Methicone</td>
<td>4,0</td>
</tr>
<tr>
<td></td>
<td>Cyclopentasiloxane (and) Dimethicone / Vinyl Dimethicone Crosspolymer</td>
<td></td>
<td>5,0</td>
</tr>
<tr>
<td></td>
<td>Dimethicone</td>
<td>Dimethicone</td>
<td>5,0</td>
</tr>
<tr>
<td>B</td>
<td>demin. Water</td>
<td>Aqua</td>
<td>up to 100</td>
</tr>
<tr>
<td></td>
<td>Glycerin</td>
<td>Glycerin</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>Pentylene Glycol</td>
<td>Pentylene Glycol</td>
<td>2,0</td>
</tr>
<tr>
<td>C</td>
<td>GlyAcid® 70 HP(^2)</td>
<td>Glycolic Acid (and) Water</td>
<td>10,7</td>
</tr>
<tr>
<td></td>
<td>NaOH</td>
<td>Sodium Hydroxide</td>
<td>up to desired pH</td>
</tr>
<tr>
<td>D</td>
<td>Preservative/Fragrance</td>
<td>-</td>
<td>q.s.</td>
</tr>
</tbody>
</table>

Suppliers:
1 Berg + Schmidt
2 Crosschem distributed by Berg + Schmidt
3 Lubrizol
4 Thor PC
Modern peeling solutions from leave-on to rinse-off
Formulation concepts

Sulfate-free peeling with BergaScrub

<table>
<thead>
<tr>
<th>Phase</th>
<th>Product</th>
<th>INCI Name</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>BergaScrub 350</td>
<td>Hydrogenated Castor Oil</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>BergaSoft SCG 22</td>
<td>Sodium Cocoyl Glycinate</td>
<td>8,0</td>
</tr>
<tr>
<td></td>
<td>Sodium Cocoyl Glutamate</td>
<td>Sodium Cocoyl Glutamate</td>
<td>6,0</td>
</tr>
<tr>
<td></td>
<td>Cocamido Propyl Betaine</td>
<td>Cocamido Propyl Betaine</td>
<td>5,0</td>
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<tr>
<td></td>
<td>Guar Gum</td>
<td>Guar Gum</td>
<td>0,5</td>
</tr>
<tr>
<td></td>
<td>Xanthan Gum</td>
<td>Xanthan Gum</td>
<td>0,8</td>
</tr>
<tr>
<td></td>
<td>demin. Water</td>
<td>Aqua</td>
<td>up to 100</td>
</tr>
<tr>
<td></td>
<td>Preservative/Fragrance</td>
<td>-</td>
<td>q.s.</td>
</tr>
</tbody>
</table>
Modern peeling solutions from leave-on to rinse-off
Formulation concepts

Hair peeling before washing with BergaScrub

<table>
<thead>
<tr>
<th>Phase</th>
<th>Product</th>
<th>INCI Name</th>
<th>% (w/w)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Carbopol Ultrez 30²</td>
<td>Carbomer</td>
<td>1,8</td>
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<tr>
<td></td>
<td>Ethanol</td>
<td>Ethanol</td>
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<td></td>
<td>EDTA</td>
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<tr>
<td></td>
<td>Glycerin</td>
<td>Glycerin</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Sorbitol</td>
<td>Sorbitol</td>
<td>2,0</td>
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<tr>
<td></td>
<td>Butylene Glycol</td>
<td>Butylene Glycol</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>demin. Water</td>
<td>Aqua</td>
<td>up to 100</td>
</tr>
<tr>
<td></td>
<td>Preservative/Fragrance</td>
<td>-</td>
<td>q.s.</td>
</tr>
<tr>
<td>B</td>
<td>NaOH</td>
<td>Sodium Hydroxide</td>
<td>0,5</td>
</tr>
<tr>
<td>C</td>
<td>BergaScrub 400¹</td>
<td>Hydrogenated Castor Oil</td>
<td>1,0</td>
</tr>
</tbody>
</table>

Suppliers:
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² Lubrizol
Modern peeling solutions from leave-on to rinse-off
Formulation concepts

Rinsable peeling with dobble action with BergaScrub and GlyAcid®

<table>
<thead>
<tr>
<th>Phase</th>
<th>Product</th>
<th>INCI Name</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Sodium Laureth Sulfate, Cocamidopropyl Betaine</td>
<td>Sodium Laureth Sulfate, Cocamidopropyl Betaine</td>
<td>10,0</td>
</tr>
<tr>
<td></td>
<td>EDTA</td>
<td>Tetrasodium EDTA</td>
<td>0,1</td>
</tr>
<tr>
<td></td>
<td>Decyl glucoside</td>
<td>Decyl Glucoside</td>
<td>2,5</td>
</tr>
<tr>
<td></td>
<td>Glycerin</td>
<td>Glycerin</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>demin. Water</td>
<td>Aqua</td>
<td>up to 100</td>
</tr>
<tr>
<td>B</td>
<td>Aqua FS-2³</td>
<td>Acrylates Crosspolymer-4</td>
<td>5,0</td>
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<tr>
<td>C</td>
<td>NaOH</td>
<td>Sodium Hydroxide</td>
<td>up to pH 7</td>
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<tr>
<td>D</td>
<td>GlyAcid® 70 HP²</td>
<td>Glycolic Acid (and) Water</td>
<td>2,9</td>
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<tr>
<td></td>
<td>NaOH</td>
<td>Sodium Hydroxide</td>
<td>up to desired pH</td>
</tr>
<tr>
<td>E</td>
<td>BergaScrub 400¹</td>
<td>Hydrogenated Castor Oil</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>Preservative/Fragrance</td>
<td>-</td>
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InCosmetics Barcelona 2015
Florence Olechowski,
R&D Manager Cosmetics
You’ll find us at stand 6N20
Thank you for your attention

Florence Olechowski, R&D Manager Cosmetics

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