

5 reasons that IPD is selected

Isopentyldiol (IPD)

Multi-functional Moisturizer

INCI Name

Isopentyldiol

Applications

Skin care

Skin lotion, Moisturizing cream, Make up remover, Facial wash, Face mask, Body wash, Liquid soap, Self tanning & Sun care,,,,

Hair care

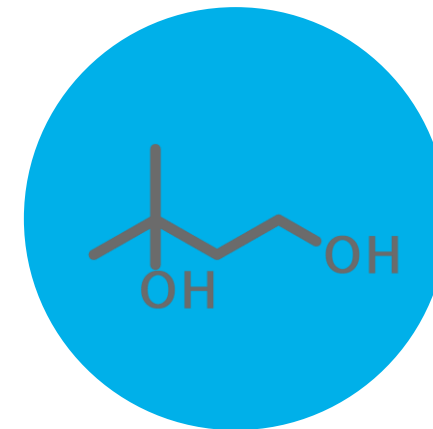
Shampoo, Conditioner, Treatment, Styling, Color treatment,,,,

Color Cosmetics

Lipstick, Foundation, Eye shadow,,,,

Others

Wet wipe, Baby care, Bath oil, Oral care, Fragrance,,,,



5 reasons that IPD is selected

Smooth and Silky feeling / No irritation



Cleansing

Hair repair

Preservative boost

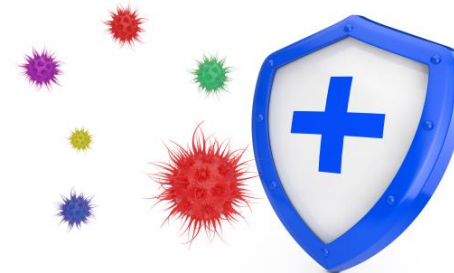
Solubilizing



Gently cleans makeup, sebum, keratin plug and lead healthy skin



Repair hair and lead healthy hair



Reduce preservatives and lead healthy skin



Achieve Ethanol-free and lead healthy skin

The background features several large, solid yellow circles of varying sizes scattered across the white space. The central focus is the text 'Cleansing power' in a bold, dark blue font, which is partially overlaid by one of the yellow circles.

Cleansing power

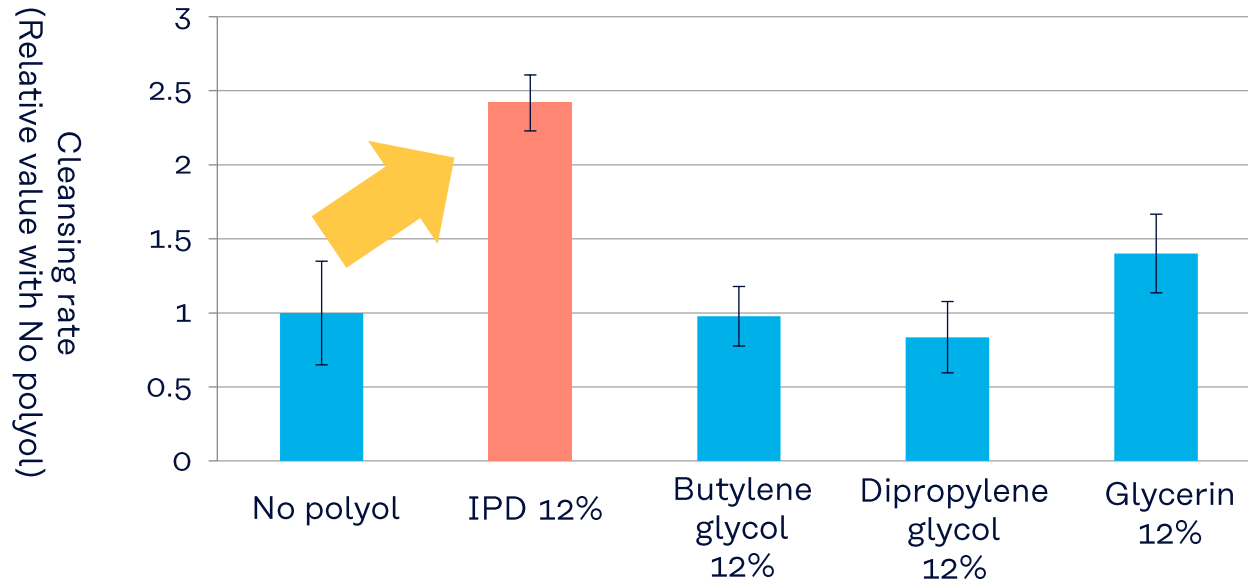
Conclusion : IPD can clean pores gently and thoroughly

Point

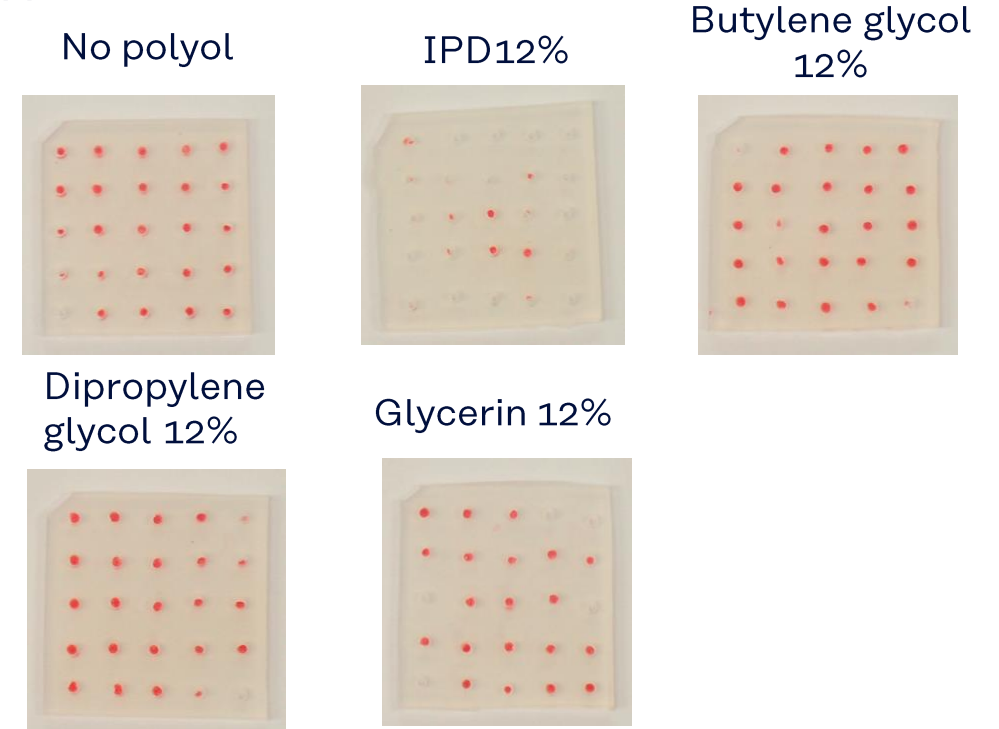
- 1 High Cleansing power (keratin plug, sebum, makeup)
- 2 Smooth feeling
- 3 No irritation

Improves the cleaning power of keratin plugs more than twice as much as conventional products

Keratin plug cleansing test of cleansing gel



Appearance

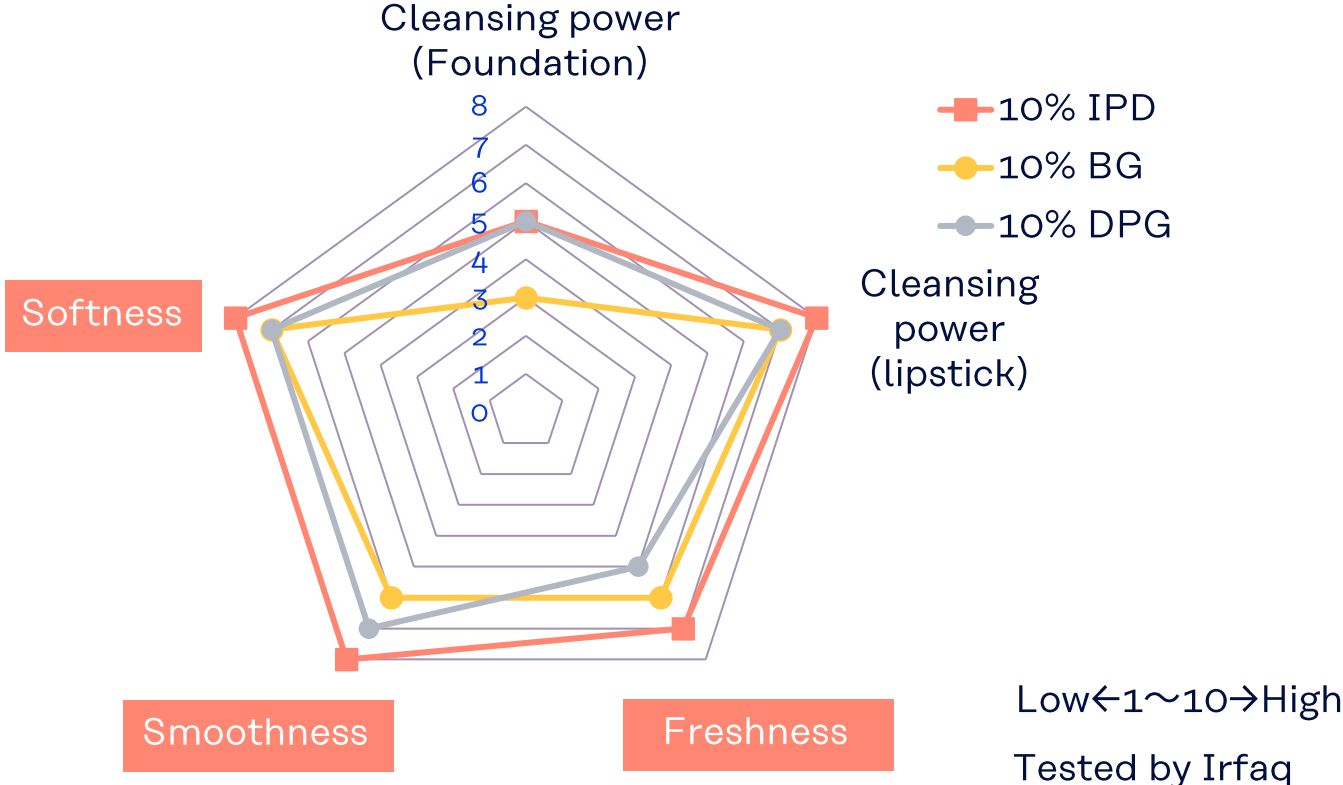


<Test>

Red-colored artificial keratin plugs were packed in silicone plates and washed with each cleansing gel.

Make Smooth feeling

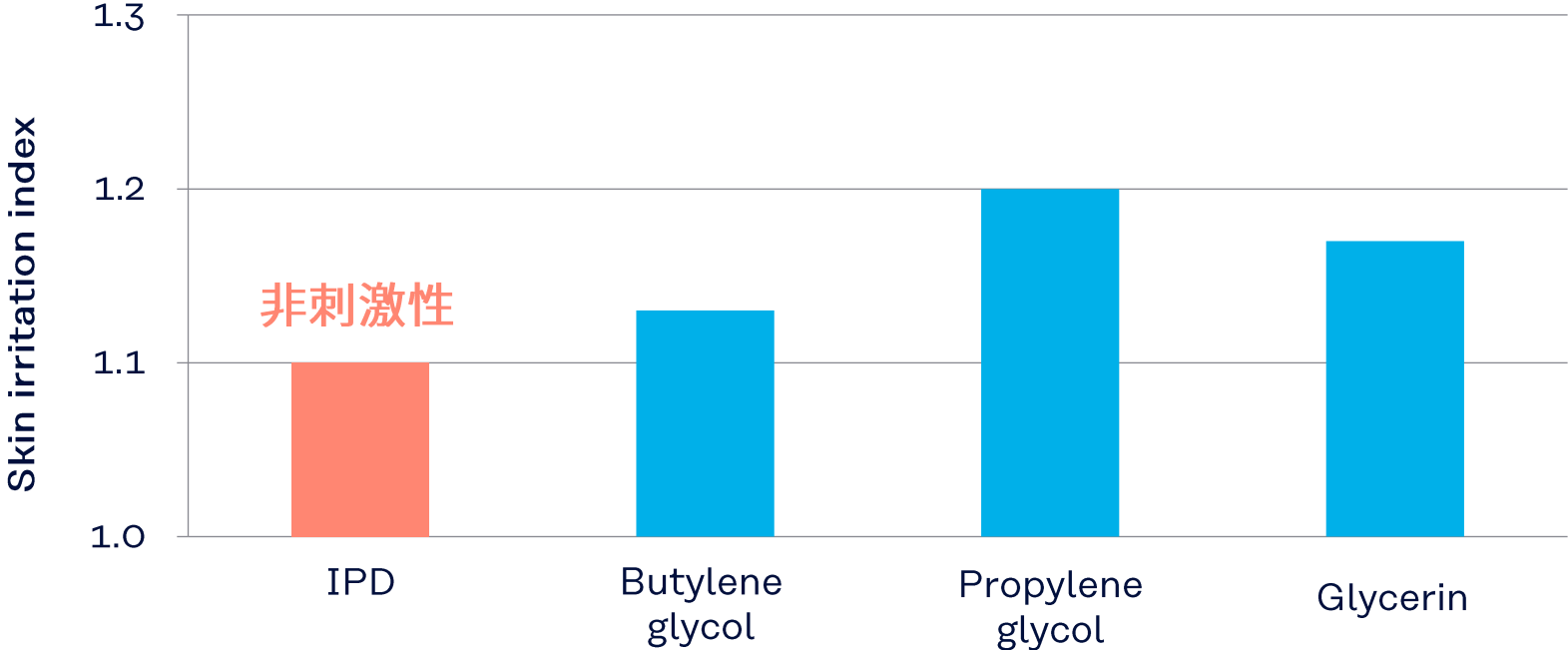
Sensory evaluation of each polyol aqueous solution



<Test>
Foundation and lipstick were applied, and cleansed with each polyol solution evaluating for their usability.

No irritation

Stinging test for sensitive skin



<Test>
Stinging tests of each polyol 50% aqueous solution were performed on 10 subjects with sensitive skin.

IPD can be used to develop safe and highly functional cleansers

- Cleansers that claim to clean pores (cleansings, facial washes, shampoos...)
- Sensitive skin and baby care cleansers that claim to be moisturizing and gentle on the skin
- Smooth feeling cleansers

etc.

The background features several large, solid yellow circles of varying sizes scattered across the white page. One large circle is positioned behind the text 'Hair repair'.

Hair repair

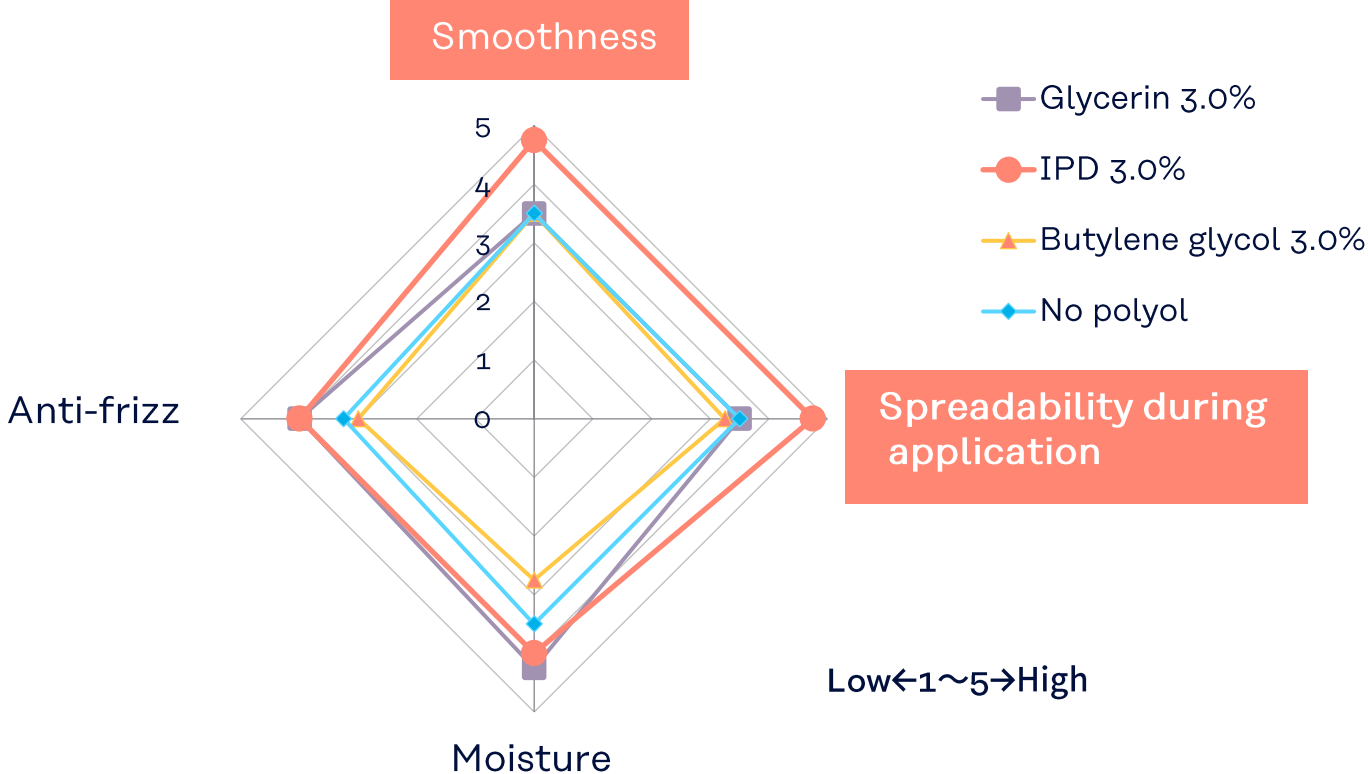
Conclusion : IPD can repair hair and make smooth feeling

Point

- 1 Smooth feeling
- 2 Hair repair effect

Make Smooth feeling

Sensory evaluation of hair cream

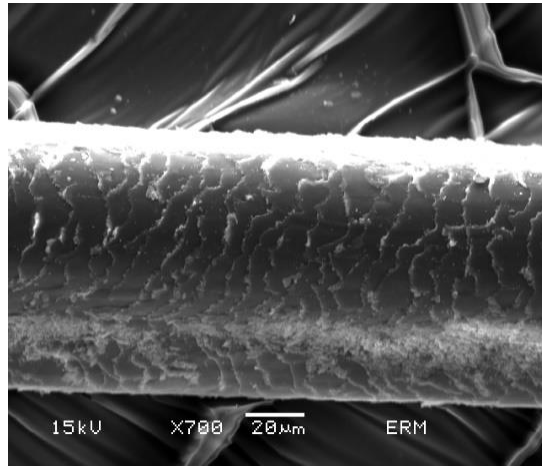


<Test>
Evaluated the performance of each hair cream

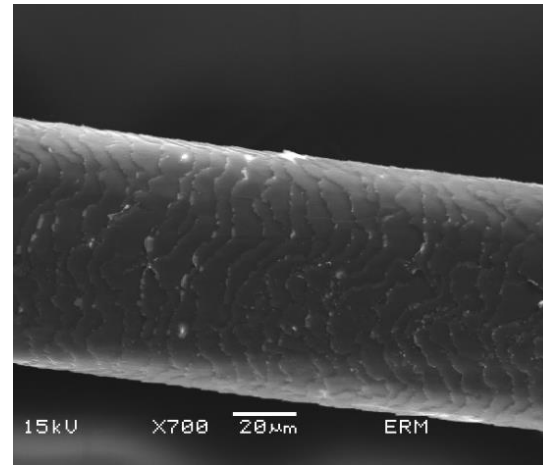
Repair cuticle of hair in combination with sugars

Appearance observation with SEM

Damaged Hair (Before)



After treated with the solution of
IPD 5% & Sorbitol 5%



Repair cuticle

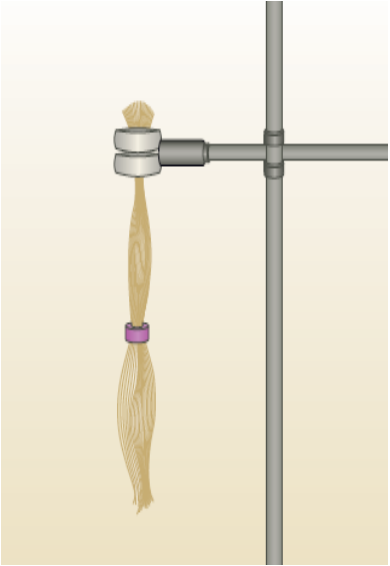
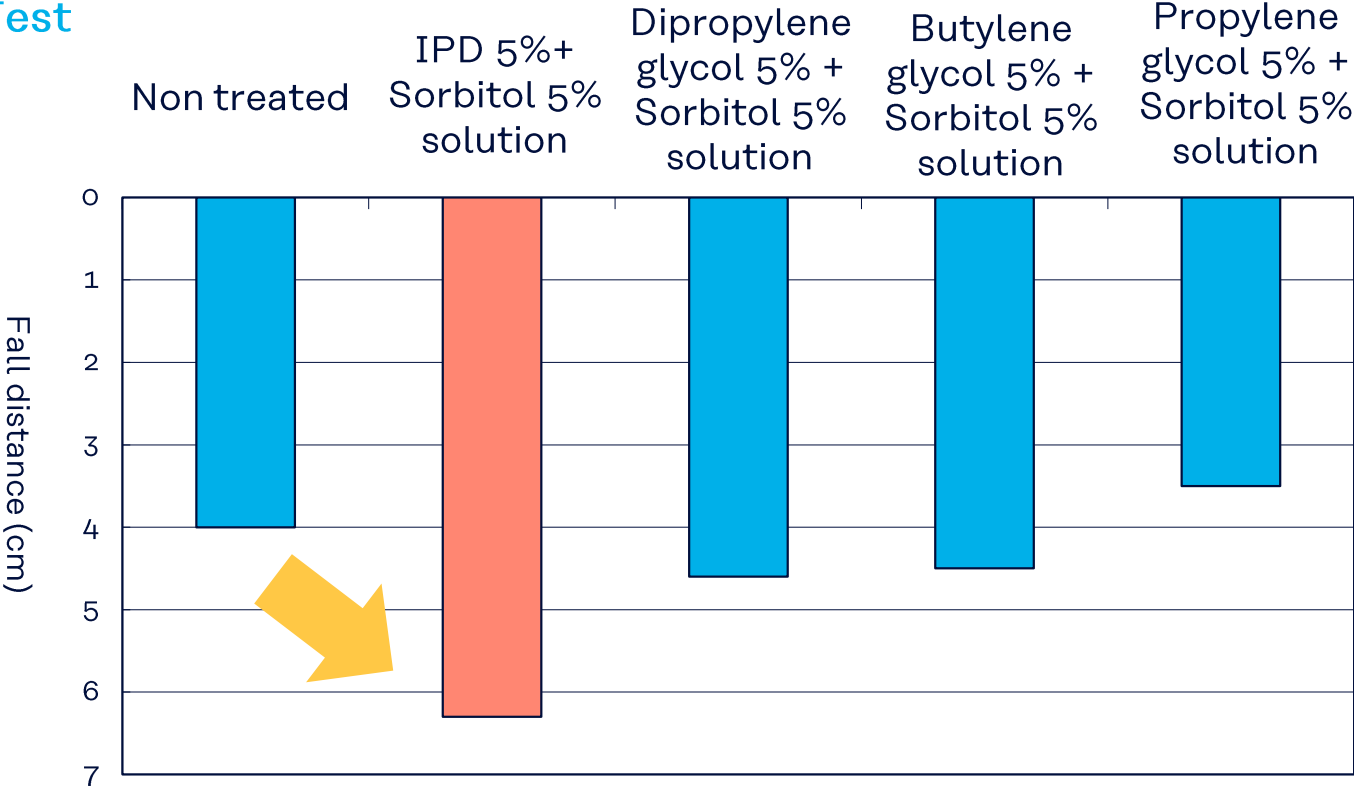
Tested by Irfaq

<Test>

- The damaged hair soaked in the water solution of 5% IPD & 5% Sorbitol for 30 min.
- After wash and dried, compared the appearance of "before" & "after" with SEM

Make hair smooth in combination with sugars

Ring Drop Test



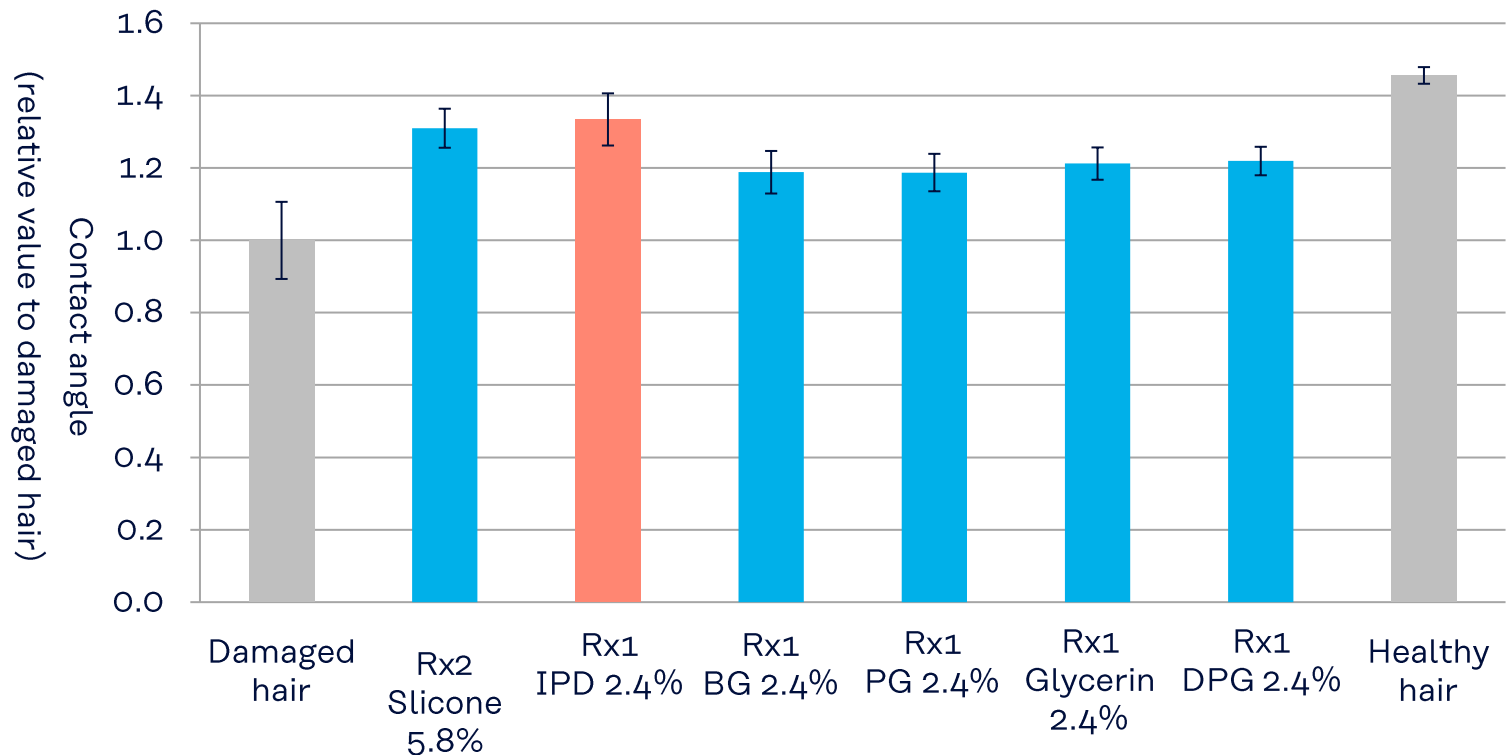
Tested by Irfaq

<Test>

- The damaged hairs were soaked in each water solution.
- After washed and dried, the hairs were clipped & made the rings slide along with the hairs.
- Measured the fall distances which mean "how the hair was treated smooth" (n=5)

IPD provides comparable conditioning effect to Silicone

Measurement of contact angle of water on hair



Treatment's formulation

Ingredients	Rx1	Rx2
Steartrimonium Chloride	2.6	2.6
Behentrimonium Chloride	1.2	1.2
Cetyl Alcohol	3.6	3.6
Polyol x	2.4	-
Trehalose	2.4	-
Cetyl Ethylhexanoate	3.0	3.0
Olea Europaea (Olive) Fruit Oil	1.2	1.2
Octyldodecanol	0.8	0.8
Pentylene glycol	1.2	1.2
Ethylhexylglycerin	0.3	0.3
Phenoxyethanol	0.5	0.5
Amodimethicone	-	0.8
Dimethicone (10cSt, high polymerization)	-	4.0
Dimethicone (1000cSt)	-	1.0
Lactic Acid	pH3.5	pH3.5
Water	to 100	to 100

<Test>

Bleached hair bundles were treated with each treatment for 2 minutes, and 1 μ L drops of water were dropped onto the dried hair and the contact angle was measured. (n=10)

IPD can be used to develop highly functional hair care products

- Smooth feeling hair care
- Hair care that claim to repair hair
- Silicone-free hair care

etc.



Preservative boost

Conclusion : IPD helps to make Paraben-free and Preservative-free cosmetics

Point

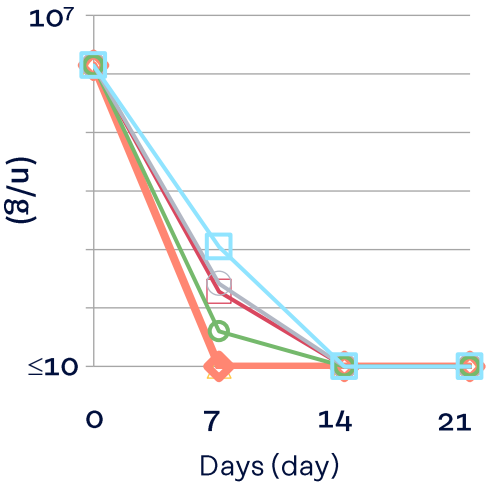
- 1 Preservative boost effect
- 2 No irritation

Boost preservative effect when used in combination with phenoxyethanol, a commonly used paraben alternative

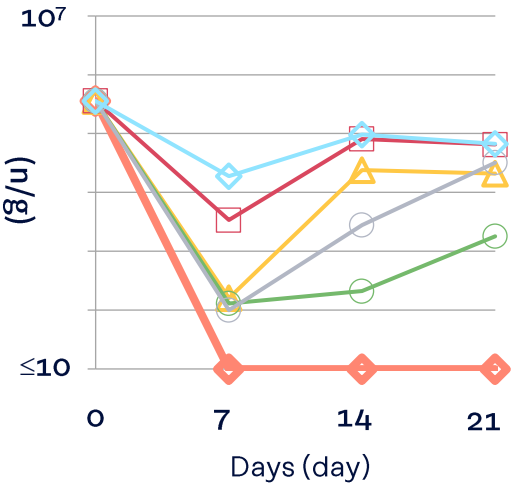
Challenge test of Lotion including IPD & Phenoxyethanol

Inhibits bacterial growth better than other polyols

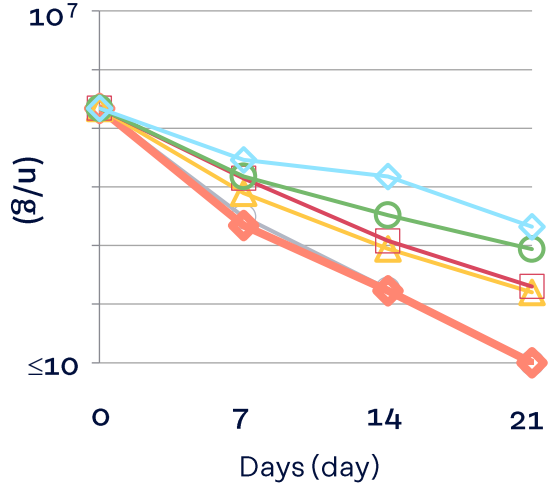
Microbe mixture 1



Microbe mixture 2



Microbe mixture 3



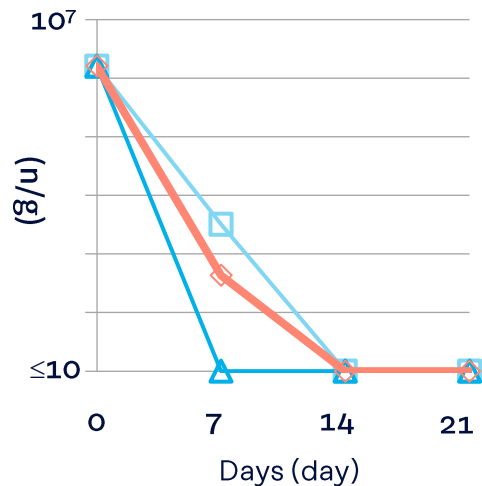
- Propanediol 5%, Phenoxyethanol 0.3%
- ◇ IPD5%, Phenoxyethanol 0.3%
- △ Butylene glycol 5%, Phenoxyethanol 0.3%
- Propylene glycol 5%, Phenoxyethanol 0.3%
- Dipropylene glycol 5%, Phenoxyethanol 0.3%
- ◇ Phenoxyethanol 0.3%

<Test>
 Do the challenge test of each lotion.
Microbe mixture 1; bacteria
 Mixture of *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*
Microbe mixture 2; Kitchen draining filter liquid
 Highly detected microbe: *Enterobacter*, *Citrobacter*, *Serratia*, *Klebsiella*, *Pseudomonas*, *Acinetobacter*, *Bacillus* and *Candida*
Microbe mixture 3; fungus
 Mixture of *Aspergillus brasiliensis*, *Candida albicans*, *Penicillium citrinum*, and *Aureobasidium pullulans*

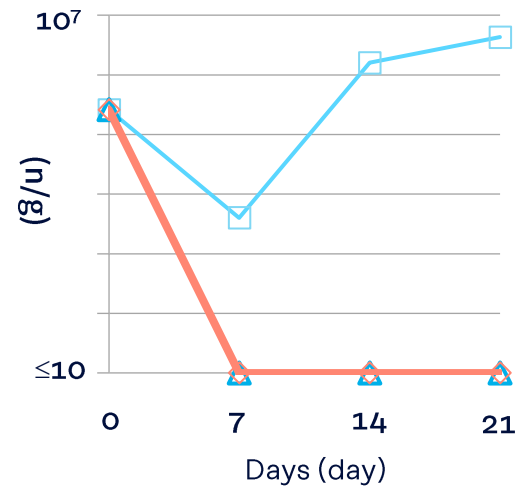
Boost preservative effect when used in combination with pentylene glycol, a commonly used preservative alternative

Challenge test of Lotion including IPD & Pentylene glycol

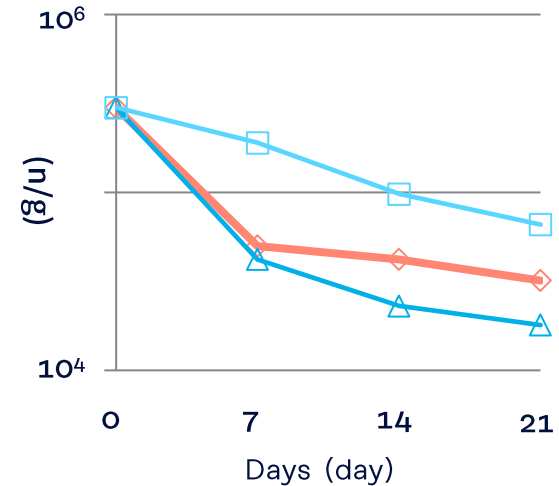
Microbe mixture 1



Microbe mixture 2



Microbe mixture 3



- IPD 5%, Pentylene glycol 2.0%
- Pentylene glycol 3.5%
- Pentylene glycol 2.0%

<Test>

Do the challenge test of each lotion.

Microbe mixture 1; bacteria

Mixture of *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*

Microbe mixture 2; Kitchen draining filter liquid

Highly detected microbe: *Enterobacter*, *Citrobacter*, *Serratia*, *Klebsiella*, *Pseudomonas*, *Acinetobacter*, *Bacillus* and *Candida*

Microbe mixture 3; fungus

Mixture of *Aspergillus brasiliensis*, *Candida albicans*, *Penicillium citrinum*, and *Aureobasidium pullulans*

IPD can be used to develop Paraben-free and preservative-free cosmetics

- Paraben-free / Preservative-free skin care, hair care
- Sensitive skin and baby care products for high safety
- Large capacity facial masks for easy secondary contamination

etc.

The background features several large, solid yellow circles of varying sizes scattered across the white page. The word "Solubilizing" is centered in a dark blue, bold, sans-serif font, with one of the yellow circles partially overlapping the letter "i".

Solubilizing

Conclusion : IPD helps to make Ethanol-free cosmetics

Point

- 1 High solubilizing power
- 2 No irritation

Solubilize oil-soluble ingredients into water

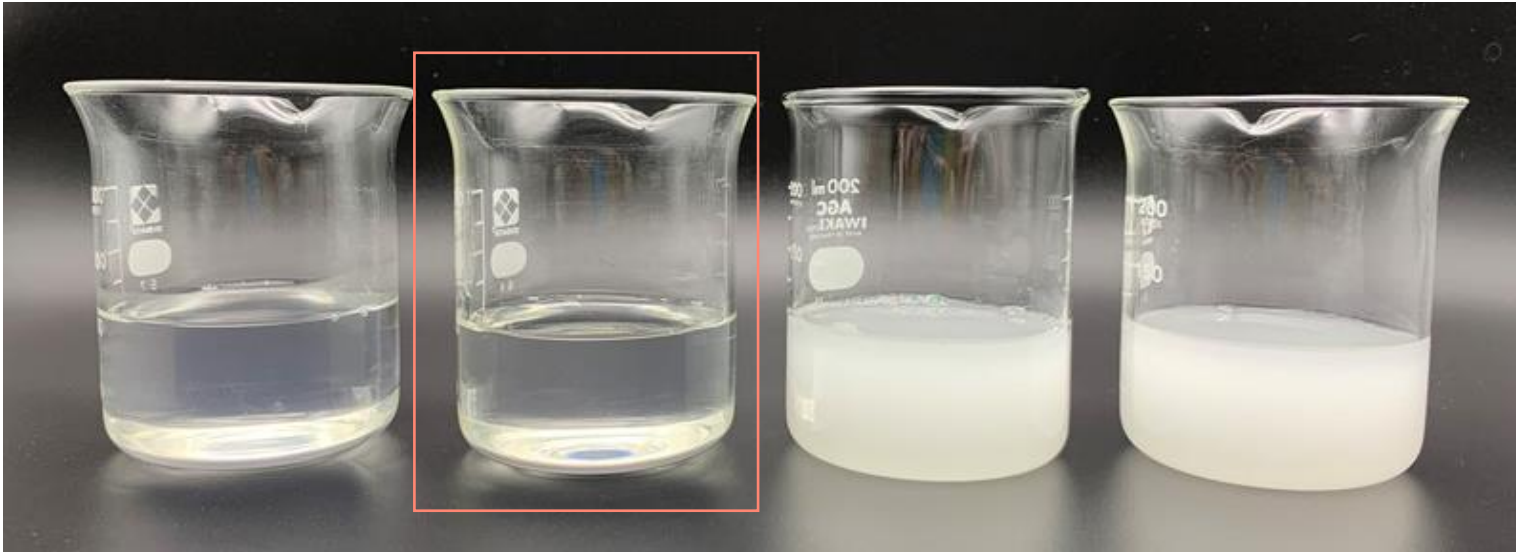
Solubilization test of Icaridin into water

Ethanol

IPD

BG

DPG



Formulation

Ingredient	wt%
Polyol X	30.0
PEG-40 Hydrogenated Castor Oil	3.0
Icaridin	15.0
Water	To 100

The insect repellent ingredient Icaridin, which was conventionally dissolved in ethanol, was solubilized in water

Solubilize various oil-soluble ingredients

Solubilizing test of oil-soluble ingredients into water

Oil-soluble ingredients	No polyol	IPD	Butylene glycol	Dipropylene glycol
Tocopherol	Clouded	Clear	Clouded	Clouded
Menthol	Clouded	Clear	Clear	Clouded

Formulation

Ingredient	wt%
Polyol X	5.0
PEG-60 Hydrogenated Caster Oil	1.0
Oil based ingredient Y	0.05
Water	To 100

Appearance of tocopherol mixed

No polyol



IPD



Butylene glycol



IPD can be used to develop Ethanol-free cosmetics

- Ethanol-free sensitive skin and baby care products
- Ethanol-free insect repellent for children
- Ethanol-free perfume

etc.



Thank you!

kuraray