

ISOPENTYLDIOL



kuraray



Isopentyldiol

A multi-purpose ingredient for innovative cosmetic formulations

Isopentyldiol is a multi-purpose cosmetic ingredient produced by Kuraray. It is a clear, colorless, odorless and totally water-soluble liquid that is safe to use and environmentally friendly.

INCI : Isopentyldiol

Applications

- Skin care
- Sun care & after sun creams, self-tanning products
- Hair care & body wash
- Baby care
- Toiletries
- Wet wipes
- Decorative cosmetics

Possible formulation types

- Creams, Gels, Waxes, Oils, Micellar waters, Masks, Serums, Sprays, Foaming products, Aerosols, Powders ...

Benefits

- Hair repair
- Color protection
- Emollience : Silky touch and non-tacky skin feel
- Hydration : Provides immediate moisturizing effect
- Dispersant : allows homogeneous powder and pigment spreading
- Solubilizer : efficient for actives difficult to solubilize and then for transferring them from one phase to the other

Registration status

- REACH registered
- Quasi drug in Japan
- Listed CRC-Sepa in China
- MITI
- TSCA
- ELINCS

Skin Care



- Applications : skin milk, body lotion, cream gel, anti-age, after shave, ...
- Benefits : skin feel improved, incorporation of difficult to solubilize actives, moisturizing effect in combination with sorbitol, emulsion stabilizer, preservative booster

Sun Care



- Applications : sunscreen cream and lotion, self-tanning products, after-sun milk
- Benefits : excellent dispersion of mineral filters, non-tacky skin feel, non-whitening effect of TiO₂ filters, homogeneous spreading of pigments and actives (DHA), stable at very low pH, hydrating effect in combination with sorbitol, helps penetration of some actives.

Hair Care



- Applications : shampoo, conditioner, coloration protection, spray lotion, texturing gel and powder, beard and hair styling wax
- Benefits : foam enhancer in SLES systems, hair repair in combination with sorbitol, hair strengthening after coloration, fully water miscible, anti-frizz effect, preservative booster

Baby Care



- Applications : body wash, body lotion, mild shampoo, UV protection milk
- Benefits : excellent toxicological profile, mild formulations, improved skin feel, synergetic moisturizing effect with sorbitol

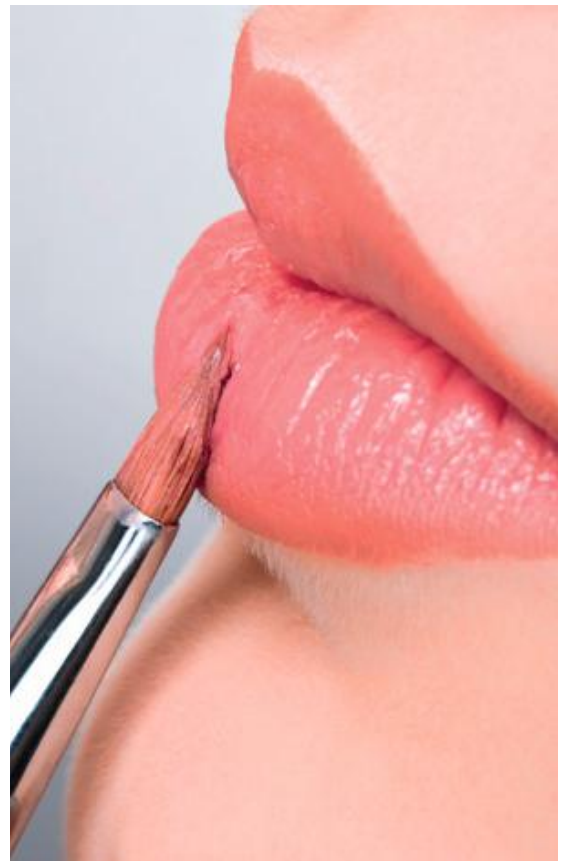
Toiletries



- Applications : hand gel, body wash, micellar lotion, day and night serum, make up remover, facial mask, wet wipe, deodorant spray, toothpaste
- Benefits : nice skin after feel, excellent performance on lipstick removal, allows lower alcohol content in perfumery or hand gels, higher foam with SLES systems, hydration effect with sorbitol

Decorative cosmetics

- Applications : compact powder, lipstick, cast and liquid foundation, eye shadow, lip-gloss
- Benefits : binding aid - improves breakage resistance, good compatibility with powders, improves gliding and shining effect as well as pick-up, allows homogeneous spreading of the pigments, enhances overall skin feel



Additional characteristics and benefits



- Robust molecule
 - pH stable
 - Stable at low and high temperature
 - Stable to oxidation
- Fully water soluble
- Soluble in some oils (adipates, sebacates - short chains)
- HLB Value : 8,9
- Readily biodegradable
-





Adding value to your products - worldwide



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A multi-purpose ingredient for Skin Care

Isopentyldiol is a multi-purpose ingredient produced by Kuraray. It is a clear, colorless, odorless and totally water-soluble liquid that is safe to use and environmentally friendly.

Main skin care applications

- Anti-aging creams
- Moisturizing creams
- Balms
- Day & night creams
- Eyes & lips contour
- Gels
- Serums



Main benefits

- Incredible silky and non-tacky skin feel
- O/W Emulsion stabilizer (reduces oil droplets size)
- Immediate moisturizing effect
- Good solubilizer and carrier of active ingredients (lipophilic & hydrophilic)

Type	Active	@ 20°C in IPD	@ 40°C in IPD
Lipophilic	Resveratrol	8%	8%
	<i>Boswellia Serrata</i> extract	20%	20%
Hydrophilic	Glabridin	5%	6.5%
	Trimethylglycine	8%	8%

Registration status

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Anti-age cream

Incorporation of a difficult active in aqueous phase

Phase	Trade Name	INCI Name (EU)	%w/w
A	PROLIX RB	POLYGLYCERYL-3 RICE BRANATE	5.00
	LANETTE O	CETEARYL ALCOHOL	0.50
	CETIOL OE	DICAPRYLYL ETHER	3.00
	MYRITOL 318	CAPRYLIC/CAPRIC TRIGLYCERIDE	4.00
	JOJOBA OIL	SIMMONDSIA CHINENSIS SEED OIL	1.50
	TEGIN M	GLYCERYL STEARATE	1.00
B	DEMIN. WATER	AQUA	20.25
	XANTHAN GUM 80 MESH	XANTHAN GUM	0.10
B1	ISOPENTYLDIOL	ISOPENTYLDIOL	4.00
	DEMIN. WATER	AQUA	53.00
	GLABRIDIN	GLABRIDIN	0.05
	NATRLQUEST E 30	AQUA (and) TRISODIUM ETHYLENDIAMINE DISUCCINATE	2.00
	TREHALOSE 100	TREHALOSE	1.50
	NATURAL EXTRACT AP	BETAINE	1.50
C	SF 1202	CYCLOPENTASILOXANE	3.00
D	GERMABEN II	PROPYLENE GLYCOL (and) DIAZOLIDINYL UREA (and) METHYLPARABEN (and) PROPYLPARABEN	1.00
E	FRAGRANCE	PARFUM	0.20
			100

Appearance : white cream

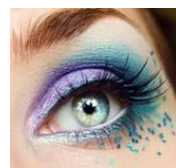
Method : First, add Xanthan gum to water (phase B) stirring for about 5 minutes, and heat @ 75°C until complete dispersion & swelling of polymer. Then, melt ingredients of phase A @ 75°C while mixing. Add phase B to phase A while stirring for about 10 minutes. Add slowly B1 while stirring. If necessary, cool to 40°C & add in sequence C, D and E, while stirring until homogeneity is obtained. Cool to room temperature while stirring.

A multi-purpose ingredient for Color Cosmetics

Isopentyldiol is a multi-purpose cosmetic ingredient produced by Kuraray. It is a clear, colorless, odorless and completely water-soluble liquid. Safe to use and environmentally friendly.

Main applications for color cosmetics

- Lipsticks (liquid & solid)
- Eye-shadows (compact & liquid)
- Foundations (compact & paste)
- Primers



Main benefits

- Incredible silky and non-tacky skin feel
- Improves the gloss (refractive index 1.443)
- Improves pick-up, spreading & sliding
- Good wetting and dispersion properties : TiO₂ (4/5); FeO₂ (1/1)
- Helps casting viscous foundations (up to 80-85°C)
- Improves the drop-test challenge for compact powders
- Immediate moisturizing effect

Drop from 30 cm height		Breakage after fall, sdt compact powder	Breakage after fall, with 5% IPD
Sample 1	First fall Second fall Third fall	Very slight breaking Very slight breaking Breaking	None None None
Sample 2	First fall Second fall Third fall	None Slight breaking Breaking	None None None
Sample 3	First fall Second fall Third fall	None None Slight breaking	None None Slight breaking

Registration status

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Compact face powder

Good compatibility with high level of Mica.

IPD is used as a binding-aid & improves breakage resistance.

Phase	Trade Name	INCI Name (EU)	%w/w
A	UNIPURE YELLOW LC 182	CI 77492	2.00
	UNIPURE RED LC 381	CI 77491	0.30
	UNIPURE BROWN LC 889	CI 77491 (and) CI 77499	0.50
	UNIPURE BLACK LC 989	CI 77499	0.20
	UNIPURE WHITE LC 981	CI 77891	13.00
B	TALCO 10 DEC	TALC	17.50
	SERICITE DNN	MICA	50.00
	MAGNESIUM STEARATE	MAGNESIUM STEARATE	2.00
C	DERMOFEEL BGC	BUTYLENE GLYCOL DICAPRYLATE/DICAPRATE	2.00
	PHENOXYETHANOL	PHENOXYETHANOL	0.80
	BEE SWAX	CERA ALBA	0.50
C1	FRAGRANCE	PARFUM	0.20
D	ISOPENTYLDIOL	ISOPENTYLDIOL	5.00
			100

Appearance: beige powder

Production method:

Preliminary action: melt ingredients C @ 70-75°C while mixing. Add C1 just before the introduction in the main container and stir.

Method:

Mill the ingredients A until complete micronisation of powders & homogeneity of colour. Add in sequence ingredients B, milling after each addition until complete homogeneity of powders.

Add in sequence phase (C+C1) and D milling until complete homogeneity of product. Sift once and repeat a second time before pressing

A multi-purpose ingredient for Body Care & Toiletries

Isopentyldiol is a multi-purpose cosmetic ingredient produced by Kuraray. It is a clear, colorless, odorless and totally water-soluble liquid that is safe to use and environmentally friendly.

Main body care and toiletries applications

- Body milk
- Sun care & after sun lotion
- Hand cream & balm
- Hair & body wash
- Make up remover
- Face cleanser
- Deodorant
- ...

Main benefits

- Enhances skin feel and is non-tacky
- Provides immediate moisturizing effect
- Increases O/W emulsions (finer oil droplets)
- Boosts foam in SLES systems
- ...



Registration status

- REACh registered
- Quasi drug in Japan
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Make up Remover

Phase	Trade Name	INCI Name (EU)	%w/w
A	Demin. Water	Aqua	85,3
	Glycerin (Oleon)	Glycerin	2
	IPD	Isopentyldiol	11,7
B	Aquasiloil Inca Inchi (781003)	Aqua And Plukenetia Volubilis Seed Oil And Lysine And Sodium Chloride And Glycerin	1
			100

Production method:

1. Add water to a beaker and then start stirring
2. While stirring add Glycerin and Isopentyldiol (Mix 5 minutes)
3. While stirring add B to the beaker (Mix 5 minutes)
4. If necessary adjust the pH with a citric acid solution

pH 7,69

A multi-purpose ingredient for Hair Care

Isopentyldiol is a multi-purpose cosmetic ingredient produced by Kuraray. It is a clear, colorless, odorless and completely water-soluble liquid that is safe to use and environmentally friendly.

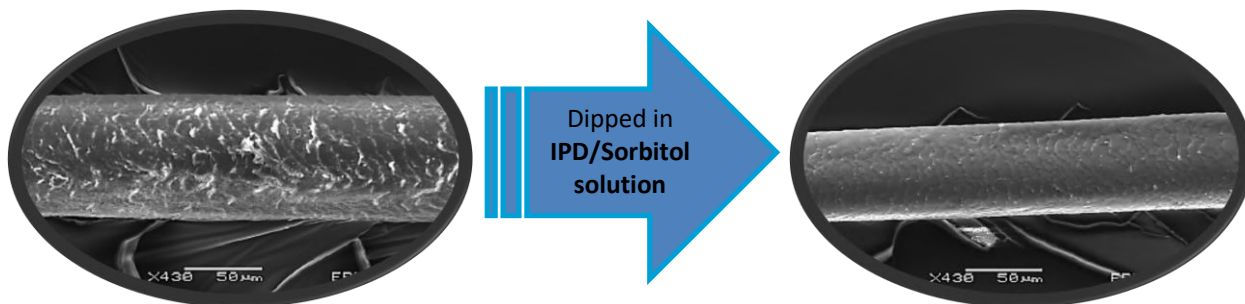
Main hair care applications

- Hair gel
- Hair wax
- Conditioner
- Anti-frizz spray
- Volumizing & texturizing powder
- Coloration protection



Main benefits

- Good solubilizer and carrier of active ingredients (lipophilic & hydrophilic)
- Generates a shiny effect (refractive index 1.443)
- Repairing effect, synergistic with Sorbitol
- Incredible silky skin feel



Registration status

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Multi-benefit spray lotion for hair

Protects, moisturizes, strengthens and repairs the hair.

It should be applied on wet hair after washing. It does not make the hair heavy nor greasy.

Phase	INGREDIENTS	INCI	% w/w
A	DEMINEALIZED WATER	AQUA	qs to 100
	STYLEZE W 10	AQUA, POLYQUATERNIUM-55	1.00
	ISOPENTYLDIOL	ISOPENTYLDIOL	5.00
	TEGO COSMO C 100	CREATINE	0.50
	NATRLQUEST E 30	AQUA, TRISODIUM ETHYLENEDIAMINE DISUCCINATE	0.15
	GENENCARE OSMS BH	BETAINE	1.00
	PANTHENOL	PANTHENOL	0.50
	RONACARE NICOTINAMIDE	NIACINAMIDE	0.30
	RONACARE BIOTIN PLUS	UREA, DISODIUM PHOSPHATE, BIOTIN, CITRIC ACID	0.20
	AC SILK HYDROLYSATE PF	HYDROLYZED SILK	0.50
	ALCOHOL DENAT.	ALCOHOL DENAT.	20.00
B	COSMACOL N 11-9	C12-13 PARETH-9	1.00
	OXYNEX K LIQUID	PEG-8, TOCOPHEROL, ASCORBYL PALMITATE, ASCORBIC ACID, CITRIC ACID	0.10
	PARFUM	PARFUM	0.30
C	LACTIC ACID SOL. 80%	LACTIC ACID	0.15
	ARGININE	ARGININE	0.05

Appearance: clear solution

pH: 4.7

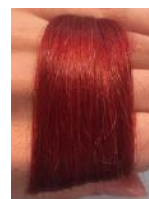
Production method: in the main mixer dissolve each ingredients of phase A, by adding them in water when mixing. Prepare phase B by mixing the ingredients, then add it to the main container while stirring. Add Lactic acid and Arginine to buffer the pH.

A multi-purpose ingredient for Hair Care

Isopentyldiol is a multi-purpose cosmetic ingredient produced by Kuraray. It is a clear, colorless, odorless and completely water-soluble liquid that is safe to use and environmentally friendly.

Main benefits

- Very high color retention improvement
- Hair strengthening after oxidation and coloration steps
- Generates a shiny effect (refractive index 1.443)
- Repairing effect, synergistic with Sorbitol
- Anti-frizz effect



Color retention

Measurement of the color variation with a colorimeter (Minolta CR-400).

$$\Delta E = \sqrt{(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2}$$

	STD	IPD treated	
ΔE	9,82	6,52	-33%

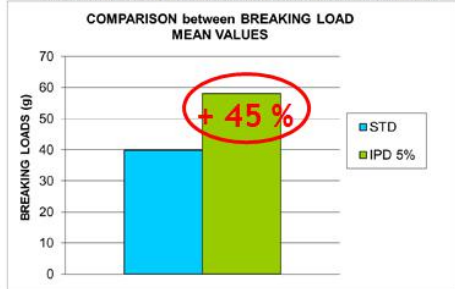
Lower ΔE = Less color change
 → Better color retention

Study performed by Rigano Laboratories, Milan

IPD increases the color retention after wash cycles

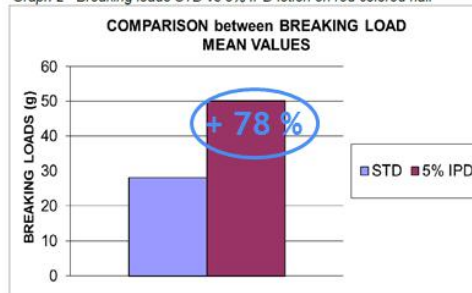
Hair strengthening

Graph 1 - Breaking loads STD vs 5% IPD lotion on blond hair



IPD increases the hair strength

Graph 2 - Breaking loads STD vs 5% IPD lotion on red colored hair



Study performed by Rigano Laboratories, Milan

Color protection shampoo

Clear shampoo (WAS≈15) formulated to preserve the hair shine and color, preventing its wash-out. It shows good foaming properties and conditioning power.

Phase	Ingredients	Inci	% W/W
A	Demin. Water	Aqua	Qs To 100
	Disodium Edta	Disodium Edta	0.25
	Isopentyldiol	Isopentyldiol	2.50
	Panthenol	Panthenol	0.10
	Sodium Benzoate	Sodium Benzoate	0.30
	Inositol	Inositol	0.10
	Gafquat 755n	Aqua, Polyquaternium-11	0.50
	Styleze W 10	Aqua, Poliquaternium-55	0.30
B	Zetesol Les 3d (27%)	Aqua, Sodium Laureth Sulfate	34.00
C	Setacin 103 Sp (38%)	Aqua, Disodium Laureth Sulfosuccinate	8.00
D	Tego Betain F 50 (38%)	Aqua, Cocamidopropyl Betaine	8.00
E	Oxetal Vd 92	Peg-90 Glyceryl Isostearate, Laureth-2	1.50
	BHA	BHA	0.10
	Parfum	Parfum	1.00
	Phenoxyethanol	Phenoxyethanol	0.80
F	Lactic Acid 80%	Lactic Acid, Aqua	0.30
G	Sodium Chloride	Sodium Chloride	1.20

Appearance: clear shampoo

pH: 4.9

Viscosity (Brookfield DV-I+, Spindle 3, 25°C):

2.5 rpm 2160 mPa.s

5 rpm 2220 mPa.s

Production method: in the main mixer dissolve each ingredient of phase A in water by mixing. Add B, C, D ingredients by mixing slowly to avoid excessive foam formation after each addition.

Prepare phase E by mixing the ingredients until complete solution, then add it into the main container while mixing.

Add ingredient F and mix.

Finally add ingredient G by mixing.

A multi-purpose ingredient for Cleansers

Isopentyldiol is a multi-purpose cosmetic ingredient produced by Kuraray. It is a clear, colorless, odorless and completely water-soluble liquid. Safe to use and environmentally friendly.

Main cleanser applications

- Liquids (incl. foaming liquids)
- Wipes
- Gels
- Milks
- Micellar lotions
- Serums



Main benefits

- Incredible silky and non-tacky skin feel
- Immediate moisturizing effect
- Excellent performance at removing lipstick while leaving nice skin after feel

	10% Isopentyl-diol	10% Propylene-glycol	10% Hexylene-glycol	10% Butylene-glycol	10% Dipropy-leneglycol
Performance as makeup remover:					
Foundation	5	5	8	3	5
Lipstick	8	6	7	7	7
Skin freshness	7	5	6	6	5
Absence of stickiness	8	8	8	6	7
Appearance of the skin after makeup removal	8	8	8	8	8
Skin softness after makeup removal	8	8	8	7	7
Absence of tight feeling after makeup removal	8	8	8	8	8

○ 1 = poor ● 8 = good

Registration status

- REACH registered
- Quasi drug in Japan
- Listed CRC-Sepa in **China**

Foaming Make-up Remover

Easy to use self-foaming type make-up remover

Part	Ingredients	% w/w	Function	Trade name / Supplier
A	HYDROGENATED POLYISOBUTENE	1.10	Make up cleansing	PERLEAM EX / NOF
	PEG-20 GLYCERYL TRIISOSTEARATE	2.70	Emulsifier	EMALEX GWIS-320EX NIHON EMULSION
	FRAGRANCE	q.s.		
B	WATER	Balance		
	ISOPENTYLDIOL	10.00	Solubilizer	IPD / KURARAY
	GLYCERIN	10.00	Moisturizer	
	AMILITE GCS-12K (30%)	10.00	Cleansing surfactant	Ajinomoto Co. Inc
	LAURAMIDOPROPYL HYDROXYSULTAINE (30%)	14.00	Cleansing surfactant	SOFTAZOLINE LSB KAWAKEN FINE CHEMICAL
	LAURYL GLUCOSIDE (50%)	2.00	Foam booster	PLANTACARE 1200 UP BASF
	AMISAFE AL-01	0.02	Foam stabilizer	Ajinomoto Co. Inc
C	DISODIUM EDTA	0.10	Chelating agent	
	PRESERVATIVES	q.s.		
		100.0		

Procedure :

- 1 Mix **part A** until uniform at room temperature.
- 2 Dissolve **part B** with stirring at 80°C.
- 3 Add **part C** to **B** and dissolve at 80°C.
- 4 Cool to 50°C with stirring, add **part A** to **B**, stir until uniform.
- 5 Cool to room temperature with stirring.

Technical information :

pH 7.3

Stability -5°C, 25°C, 45°C during 1 month