

Hexiol

Hexiol is a **versatile multifunctional ingredient**:

- **Skin-conditioning agent**: The emollient features of **Hexiol** bring a **soft and pleasant feel** to skin care formulations. **Hexiol** also functions as a **skin humectant with long lasting effect**.
- **Solubilizer**: **Hexiol** helps to **stabilize lipophilic ingredients** like perfumes inside aqueous solutions. **Hexiol** can also **help to disperse solid particles** such as pigments more easily and evenly, particularly in highly viscous products.
- **Antimicrobial agent**: **Hexiol** helps to reduce the concentration of traditional preservatives by **boosting** their effects. It can also be used on its own to **protect formulations** in the absence of conventional preservatives.

The multifunctional performances of Hexiol are highlighted in guidance formulations following the "KAWAII" attitude (samples and recipes available upon request) :

- ✓ Keep your natural complexion with **KAWAII Moisturizing Lotion**
- ✓ Blush from embarrassment with **KAWAII Blush**
- ✓ Enjoy the sweet scent of **KAWAII Perfume Water**

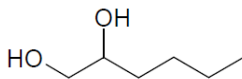
Functions

- Emollient
- Skin humectant
- Solubilizer
- Antimicrobial protection agent & Preservative booster

Applications

- Skin care
- Hair care
- Make-up
- Toiletries

Specifications and characteristics

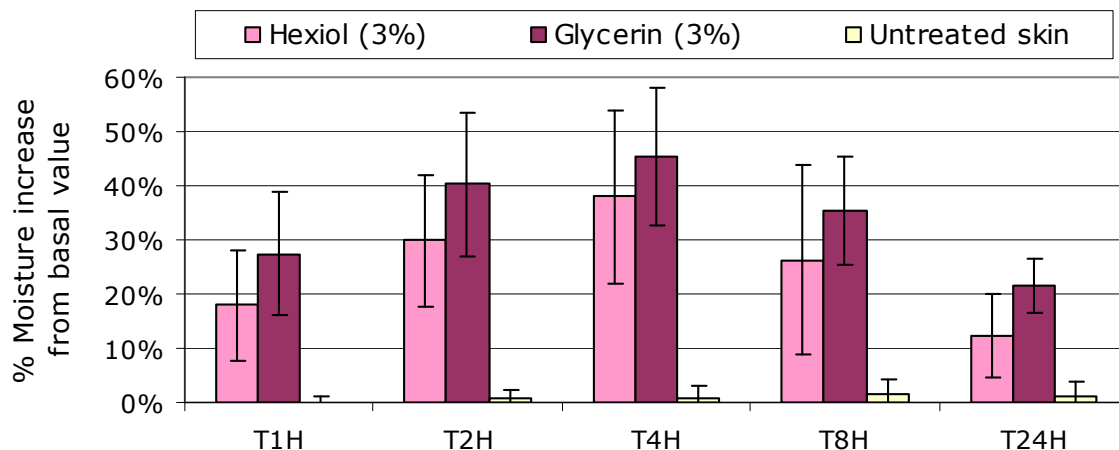
| | |
|---|--|
| INCI name | 1,2-Hexanediol |
| CAS reg. N° | [6920-22-5] |
| Recommended pH of use | 2.0 – 12.0 (unlimited) |
| Recommended use level | 0.3 to 3.0 % |
| Appearance | Colourless liquid |
| Odour | Faint characteristic |
| Purity (GC) | Min. 98.0 area-% |
| Water content | Max. 1.0 mass-% |
| Melting point | 0-5 °C |
| Boiling point | 223-224 °C |
| Regulatory status | Globally approved; safety and regulatory data available upon request |
| Origin, ISO 16128-1 | Non-natural (petrochemical) |
| Chemical structure: <div style="text-align: center;">  <chem>OCC(O)CCCC</chem> </div> | |

The above information is accurate to the best of our knowledge. Customers are advised to make their own studies on the usefulness of any ingredient for a particular application. Recommended usage information is only provided as indication, and should not be considered as recommendations to use Minasolve SAS's products in violation of any laws, patents, or official regulations dealing with manufacture, composition, local procedures, product design, or end usage.

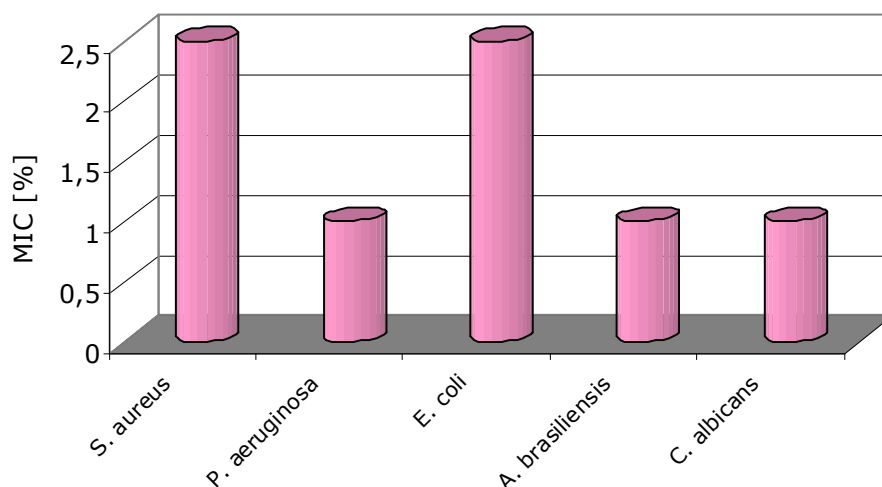
Performances

Corneometry study of aqueous solutions – PhD Trials, Lisbon

The **skin humectant** effect of **Hexiol** was demonstrated in a corneometry study in comparison with Glycerin. The two test substances were both applied as an aqueous solution to the forearm area. It was shown that **Hexiol** is an efficient skin moisturizer with a long lasting effect similar to that of Glycerin.



Minimum Inhibitory Concentrations (MIC)



Hexiol exhibits a pH-independent antimicrobial effect against yeasts, moulds and bacteria by disrupting the physical integrity of their cell membranes. This mechanism of action is unlikely to be affected by resistance.

Hexiol can also be favorably combined with other ingredients for enhanced antimicrobial effectiveness.

Microbial Challenge Test according to ISO 11930

Hexiol can act as a **standalone preservative**, as demonstrated in the following O/W-emulsion, pH 5.5 (*):

| Phase | Ingredient | INCI name | % |
|----------|---------------------------------|---|------------|
| A | Water | Aqua | ad 100.0 |
| | Hexiol ¹⁾ | 1,2-Hexanediol | 2.0 |
| | Xanthan Gum PC ²⁾ | Xanthan Gum | 0.5 |
| B | Emulgade PL 68/50 ³⁾ | Cetearyl Glucoside (and) Cetearyl Alcohol | 5.0 |
| | Lipex Sheasoft ⁴⁾ | Butyrospermum Parkii (Shea) Butter | 3.0 |
| | Joboba Oil | Simmondsia Chinensis (Jojoba) Oil | 3.0 |
| | Hazelnut Oil | Corylus Americana (Hazel) Seed Oil | 3.0 |
| C | Bioxan T70 ⁵⁾ | Tocopherol | 0.1 |
| D | Citric Acid (5 % aq.) | Aqua (and) Citric Acid | ad pH 5.5 |

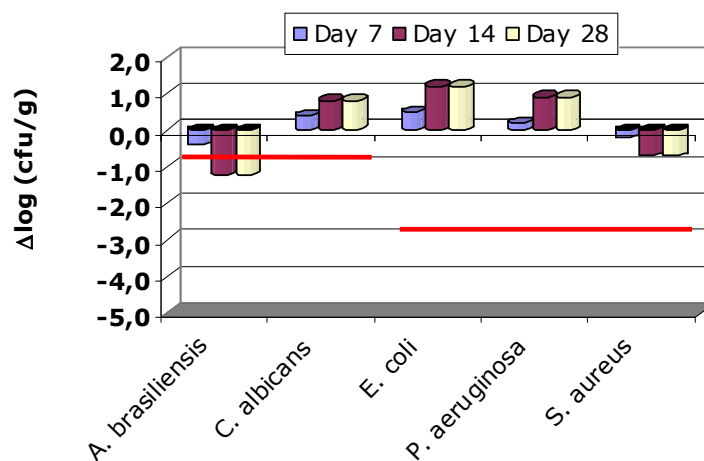
Raw materials suppliers:

1) **Minasolve**
2) Jungbunzlauer

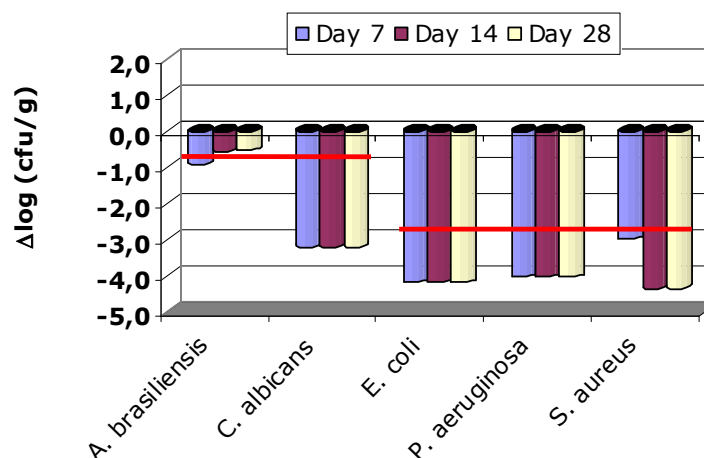
3) BASF
4) Aarhus Karlshamn (AAK)

5) BTSA

O/W-emulsion, 0 % Hexiol



O/W-emulsion, 2 % Hexiol



*Results within experimental error of 0.5 delta log (cfu/g)

— ISO 11930 requirements for log cfu reduction after 28 days (criteria A)

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Formulation guidelines

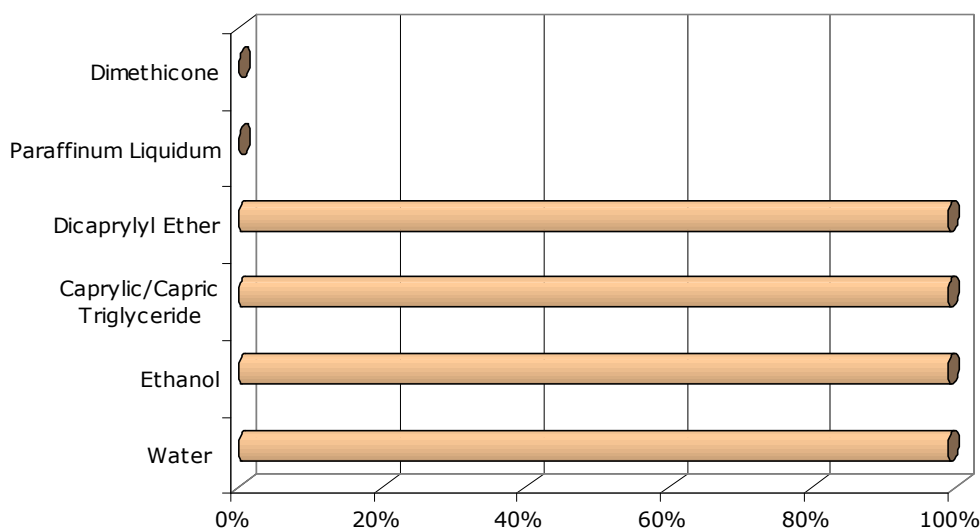
Hexiol is an **easy to handle liquid** that can be added directly to the water phase. For optimum antimicrobial efficacy in emulsions, **Hexiol** can be added either upfront in the water phase, or once the emulsion has been made and cooled down to ambient temperature.

Hexiol is an efficient **solubilizer for lipophilic active ingredients** (e.g. perfumes) in aqueous solutions. **It does not introduce any additional odour.**

In color cosmetics **Hexiol** helps **disperse pigments** (e.g. TiO₂, Mica, Carmine), especially in thick formulations.

Solubility in cosmetic solvents

Hexiol is soluble in water, alcohols, polar oils and in many lipophilic emollients.



Bibliography

- Asako Aono et al., "Calorimetric Study of the Antimicrobial Action of Various Polyols Used for Cosmetics and Toiletries", *Netsu Sokutei* **1999**, 26 (1), 2-8.
- Pillai R. et al., "1,2-alkanediols for cosmetic preservation", *Cosmetics & Toiletries Magazine* **2008**, 123 (10), 53-61.
- Bergfeld W.F. et al., "Final Report of the Cosmetic Ingredient Review on the Safety Assessment of 1,2-Glycols as Used in Cosmetics", *Cosmetic Ingredient Review*, **2011**.
- Schnittger S. et al., "Use of alkanediols in personal care formulations – closer look at antimicrobial activity", *Proceedings of the SCC Annual Scientific Meeting & Technology Showcase*, New York, **2006**.
- Kirk-Othmer, *Concise Encyclopedia of Chemical Technology*, Wiley Interscience, New York, **1985**, pp 566-568.

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