Etidronic acid

INCI	Etidronic acid
CAS	2809-21-4

SPECIFICATIONS

Appearance	Colorless to pale yellow transparent liquid
Odor	Odorless
Active content (%)	58 – 62

GENERAL INFORMATION

Etidronic acid is used as a chelating agent in cosmetics, building complexes with calcium, arsenic, iron and other metal ions to neutralize them. This allows for management of the use of slightly "hard" water, which could, for example, interfere with the surfactants of the product. Chelators are often used in water softeners. This molecule does not pose any problem for human health. Its disadvantage is that, like EDTA, it is very poorly biodegradable and the complexes it forms with metals are found scattered in nature.

FORMULATIONS & RECOMMENDATIONS

Recommended use concentration

- max 1.5 % in skin and hair care products (in Etidronic acid)
- max 0.2 % in soap (in Etidronic acid)

Solubility

soluble in water

BENEFITS

- Easy to handle
- Good efficacy against ion metals
- Good stability

APPLICATIONS

Cosmetics

- Skin care
- Hair care
- Baby care
- Sun care
- Make up
- Toiletries

SHELF LIFE

12 months under proper storage conditions

EFFICACY

Etidronic acid is used for the chelation of metal ions, in particular transition metals (Fe, Cu, Mn, Zn) and water hardness ions (Ca, Mg). Stability constants of etidronic chelates have been measured and the approximate amount of free ions have been calculated

METAL	LOG K	APPROXIMATE % CHELATED	FREE METAL
Ca^{2+}	6.5	99.99997	$3x10^{-5}$
Mg^{2+}	4.5	99.997	$3x10^{-3}$
Fe^{2+}	21.6	-	$2.5x10^{-20}$
Cu^{2+}	6.4	99.99996	$4x10^{-5}$
Mn^{2+}	6.9	99.99999	$1.2x10^{-5}$
Zn^{2+}	10.6	-	$2.5x10^{-9}$

In most cases, stability constants greater than 5 to 6 are not needed for practical removal of unwanted metal ions.

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