

**PENTAPHARM**

# ALPHA-ARBUTIN

**ALPHA-ARBUTIN – the more effective, faster and safer approach to skin lightening. ALPHA-ARBUTIN minimizes liver spots.**

## PRODUCT DESCRIPTION

ALPHA-ARBUTIN is a pure, water soluble, biosynthetic active ingredient. ALPHA-ARBUTIN promotes lightening and an even skin tone on all skin types. ALPHA-ARBUTIN blocks epidermal melanin biosynthesis by inhibiting enzymatic oxidation of Tyrosine and Dopa. Structurally, ALPHA-ARBUTIN (IUPAC name: 4-hydroxyphenyl- $\alpha$ -D-glucopyranoside) is an  $\alpha$ -glucoside. The  $\alpha$ -glucosidic bond offers higher stability and efficacy than the  $\beta$ -form in the related beta-arbutin. This leads to a skin lightening active that acts faster and more efficiently than existing single components, minimizes liver spots and reduces the degree of skin tanning after UV exposure.

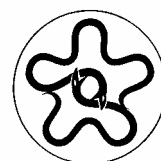
## BACKGROUND

The skin colour is determined by the interaction of different colorants. Indeed, the red staining agent of blood, haemoglobin, is responsible for reddish and bluish shades, while carotenoids are responsible for the basic yellow shade of skin. The brown coloration results from the pigments eumelanin and phaeomelanin, which are produced in special epidermal cells, the so-called melanocytes.

The enzyme tyrosinase, usually present in an inactive form, is formed in these melanocytes. Its activation by UV light triggers off melanogenesis, i.e. a complex series of enzymatic chemical reactions which finally lead to the formation of melanins.

The efficient blocking of tyrosinase inhibits the reaction chain of melanogenesis. Today many developments target efficient and fast enzyme blocking properties without any side effects.

ALPHA-ARBUTIN meets all the requirements of a modern skin-lightening and skin depigmentation product.



## EFFICACY

### INHIBITION OF TYROSINASE *IN VITRO*

ALPHA-ARBUTIN exhibits impressive *in-vitro* tyrosinase inhibition on human cell lysates compared to Beta-Arbutin.

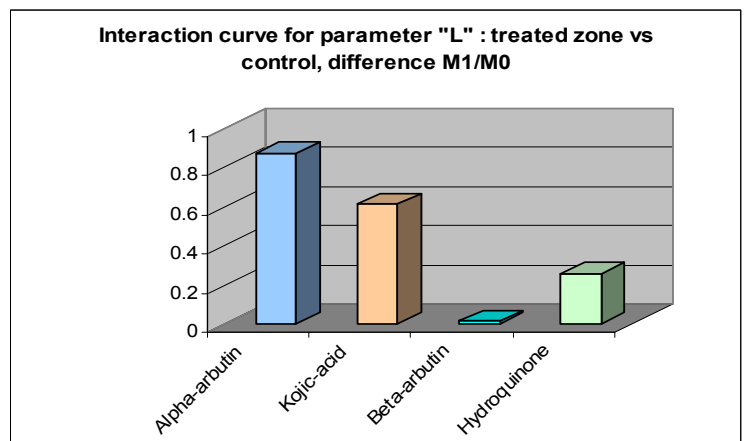
Beta-Arbutin:  $IC_{50} = 9.0$  mMol

ALPHA-ARBUTIN:  $IC_{50} = 1.0$  mMol;

### SHORT-TERM *IN VIVO* SKIN-LIGHTENING STUDY

A skin-lightening study on 80 Chinese descent women demonstrated that an emulsion containing 1% ALPHA-ARBUTIN resulted in a faster and more pronounced skin lightening effect after 1 month when compared with other commonly used single components at 1 % use levels.

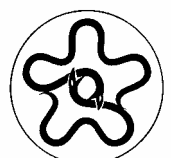
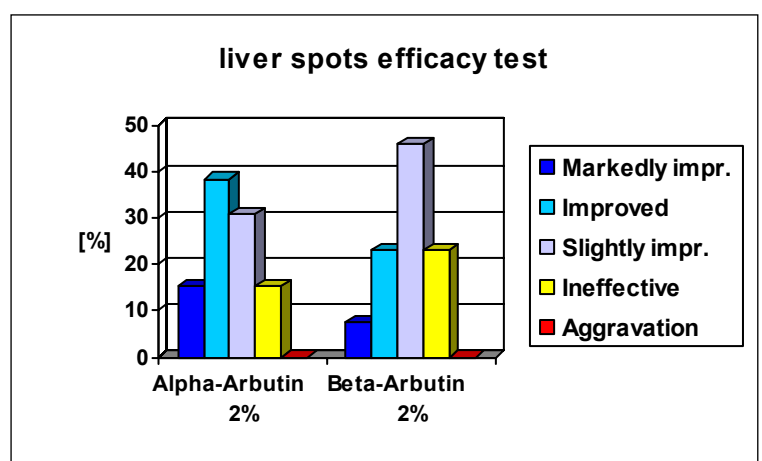
Figure 1 shows the classification of lightening single components according to the magnitude of their specific effect after 1 month ( $M_0$  = start,  $M_1$  = after 1 month) measured by chromametric studies.



### *IN VIVO* LIVER SPOTS EFFICACY STUDY

In a 3 month study on 26 female volunteers 2 % ALPHA-ARBUTIN in a cream formulation minimizes liver spots more efficiently than Beta-Arbutin.

Figure 2 shows satisfaction quotients relating to the evaluation of the liver spot reduction (WO 01/60324 Pentapharm Japan).



## ADDITIONAL STUDIES

In a double blind *in-vivo* study it could be demonstrated that ALPHA-ARBUTIN can reduce the degree of skin tanning after UV exposure. Stability tests showed that ALPHA-ARBUTIN is more stable against hydrolysis in presence of skin than Beta-arbutin.

## CONCLUSION

ALPHA-ARBUTIN acts faster, safer and more efficiently than commonly used single components

## TECHNICAL INFORMATION

### PRODUCT SPECIFICATIONS

Appearance	:	White, crystalline powder
Identity (by IR-spectroscopy)	:	corresponds to reference spectrum
Specific rotation [ $\alpha$ ]	:	+180 $\pm$ 6°
Content	:	> 97%
Loss on drying	:	< 2%
Heavy metals	:	< 20 ppm
Arsenic	:	< 2 ppm
Microbial count	:	< 100 CFU/g
Specified pathogens	:	Absent

### PRESERVATION AND MICROBIOLOGY

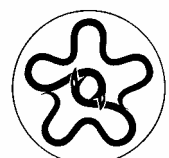
As a pure crystalline product, ALPHA-ARBUTIN doesn't contain any preservative. ALPHA-ARBUTIN is free of specified pathogens. The amount of non-pathogenic micro organisms with less than 100 CFU per g of ALPHA-ARBUTIN meets the CTFA microbiology guidelines.

### SAFETY AND ECOLOGY

Standard and well-defined safety testing has been performed on ALPHA-ARBUTIN which has proved the product to be safe for cosmetic use. The data available do not indicate any environmental risk. The manufacturing process is designed to meet the criteria for the assessment of safety, health and protection of people and of the environment set out in the *Responsible Care Program*.

### PROCESSING AND DOSAGE

ALPHA-ARBUTIN is soluble in cold water (151 g/l at 20°C) and can be easily incorporated into cosmetic formulation either warm (< 70°C) or cold. ALPHA-ARBUTIN is stable in the pH-range of 3.5 to 6.5. In formulations ALPHA-ARBUTIN is compatible with UV filters and ethanol at concentrations of up to 50%. We recommend the addition of 0.2% (when formulated with an exfoliant or penetration enhancer) otherwise up to 2%. Basic Guide Formulations are available upon request.



## STORAGE AND SHELF LIFE

ALPHA-ARBUTIN should be stored in the original sealed containers protected from light and humidity in a clean place at a temperature between 10 and 30°C. In order to avoid secondary microbial contamination, following opening, containers should be handled with special care. If stored under the recommended conditions, ALPHA-ARBUTIN remains stable for 3 years.

## GENERAL PRODUCT INFORMATION

Trade Name	:	ALPHA-ARBUTIN
Product Code	:	336-01
INCI Name (CTFA)	:	Alpha-Arbutin
EU-Labeling Name	:	Alpha-Arbutin
Chemical Name	:	4-Hydroxyphenyl- $\alpha$ -D-glucopyranoside
Molecular weight	:	272 g/mol
CAS No	:	84380-01-8
ELINCS No	:	440-470-8
JCID (Approval) No	:	Not listed
NICNAS listed as	:	Not listed
Customs Tariff No	:	2938.9090 (Harmonized System Number)
Shelf life	:	3 years

## COMPOSITION

A) Ingredient(s)	INCI Name #	Amount *
Alpha-Arbutin	Alpha-Arbutin	A

B) Additives	INCI Name #	Amount *
Solvents	None	-
Preservative	None	-
Others (buffers, antioxidants, colorants)	None	-

# CTFA Dictionary

\* FDA-Code (A = > 50%, B = 25-50%, C = 10-25%, D = 5-10%, E = 1-5%, F = 0.1-1%, G = < 0.1%)

## REMARK

Although these data and information have been prepared with the utmost possible care, we reserve the right to make changes due to product improvement and other considerations.

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