

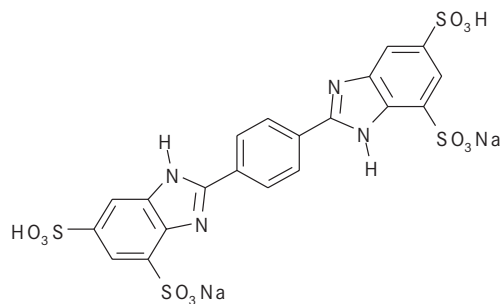
UV PROTECTION
Neo Heliopan® AP
106796



Neo Heliopan® AP No. 106796 Effective UVA Absorber

BENEFITS

- Neo Heliopan® AP is a highly effective and photostable UVA II absorber with a UV absorbance (1%/1cm) of min. 770 at around 335nm. It forms water soluble salts with the addition of a base
- Neo Heliopan® AP is practically odorless, has an excellent stability and is compatible with other ingredients and packaging
- In sun care formulations it shows synergistic effects with oil-soluble UVB filters
- In combination with the UVA I absorber Neo Heliopan® 357 very broad spectrum UVA protection products can be formulated
- It has an excellent safety profile including extremely low skin penetration
- Suitable for water-based transparent sunscreen products such as gels or clear sprays
- Water-resistant sunscreens can be formulated
- Approved to be used up to 10% in Europe, Australia, South Africa, Brasil and South Korea
- Neo Heliopan® AP is a safe and effective UVA absorber. Safety and efficacy studies are available on request



PRODUCT DESCRIPTION

- CAS No.: 180898-37-7
- ELINCS: 429-750-0
- UV-A II absorber: (water soluble)
- Molecular Weight: 674.6 g/mol
- INCI name: Disodium Phenyl Dibenzimidazole Tetrasulfonate
- USAN: Bisdisulizole Disodium
- Chemical names: 2,2'-(1,4-Phenylene) bis-[1H-benzimidazole-4,6-disulfonic acid], disodium salt
- Empirical Formula: $C_{20}H_{12}N_4S_4O_{12}Na_2$

GENERAL DESCRIPTION

Appearance/Condition at 20°C: fine yellow powder
Odor: practically odorless

ANALYTICAL DATA

Assay (HPLC)%: min. 96
Flash Point °C: > 100
Non-volatile residue%: min. 95
UV absorbance E 1%/1cm in water as sodium salt at λ max. 335 nm: min. 770
Solubility of Neo Heliopan® AP at 20°C in:

Ethanol 96 Vol%	<0.1%
Mineral Oil	not soluble
Isopropyl Myristate	not soluble
Caprylic/Capric Triglyceride	not soluble
Water (as free acid)	1%
Water (as TEA salt)	22%
Water (as sodium salt)	12%

Shelf life and storage conditions: 36 months in the original, closed container (protected from sunlight), dry, at 5 – 25°C.

IMPORTANT ADVICE FOR FORMULATIONS

- Neo Heliopan® AP is a fine yellow powder. The free acid is virtually insoluble in water
- By the addition of a base such as sodium hydroxide, potassium hydroxide or triethanolamine the water soluble salts will be formed
- Neo Heliopan® AP is strongly hygroscopic

IMPORTANT ADVICE FOR FORMULATIONS

- Neo Heliopan® AP can be added non-neutralized to the aqueous phase of the formulation, addition of a neutralization base with vigorous stirring will form the salt which then dissolves into the aqueous phase
- Neo Heliopan® AP can be also added as aqueous pre-mix
- In finished formulations Neo Heliopan® AP is stable in a wide pH range (5.0 – 9.0) without incurring the risk of crystallization
- To fulfill the requirements of the Australian Standard about 2.2% active Neo Heliopan® AP are necessary. It should be noted that Neo Heliopan® AP is not soluble in the solvents recommended by method 1 of the standard and therefore to strictly conform with the standard methods 2 or 3 should be used. An alternative solution method is to use a 50 : 50 mixture of Isopropanol and Methanol as solvent
- Care has to be taken when Neo Heliopan® AP is used in the presence of quaternary ammonium salts since complexes may form
- Tocopherol is known to incur discoloration problems in a number of formulations; therefore we recommend the usage of tocopheryl acetate when formulating with Neo Heliopan® AP
- Neo Heliopan® AP is an electrolyte and therefore will have an effect upon the viscosity of carbomer-thickened emulsions or gels. The addition of a non-carbomer derived thickening agent such as xanthan gum and its derivatives will increase the viscosity of the formulation

PREPARATION OF NEUTRALIZED AQUAEIOUS PRE-MIXES

To neutralize Neo Heliopan® AP dissolve two thirds of base in water. Then add Neo Heliopan® AP while stirring. Add slowly the remaining base until the solution becomes clear.

The pH-value of the finished Neo Heliopan® AP solution should be at 7.5 – 8.0 and has to be checked. For longer period of storage it is advisable to add preservatives to the solution.

10% solution neutralized with sodium hydroxide

79.00%	Water, demineralized
10.00%	Neo Heliopan® AP
11.00%	Sodium Hydroxide (10% solution in water)

PREPARATION OF NEUTRALIZED AQUAEOUS PRE-MIXES

22% solution neutralized with triethanolamine

67.50% Water, demineralized

22.00% Neo Heliopan® AP

10.50% Triethanolamine (99%)

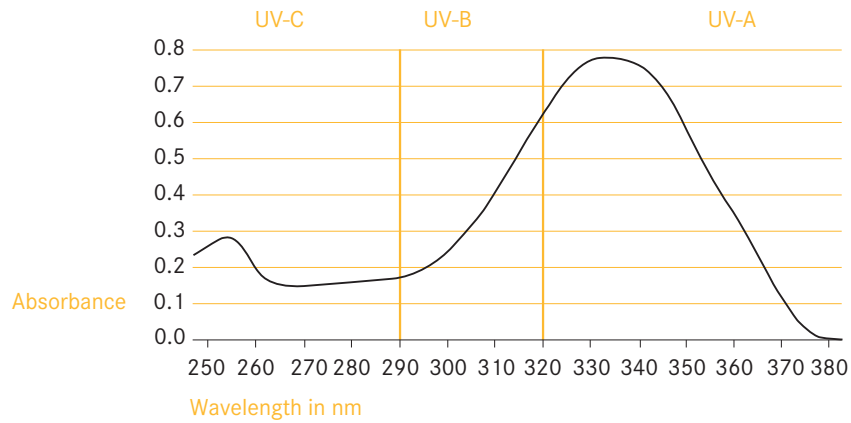
9% solution neutralized with potassium hydroxide

86.30% Water, demineralized

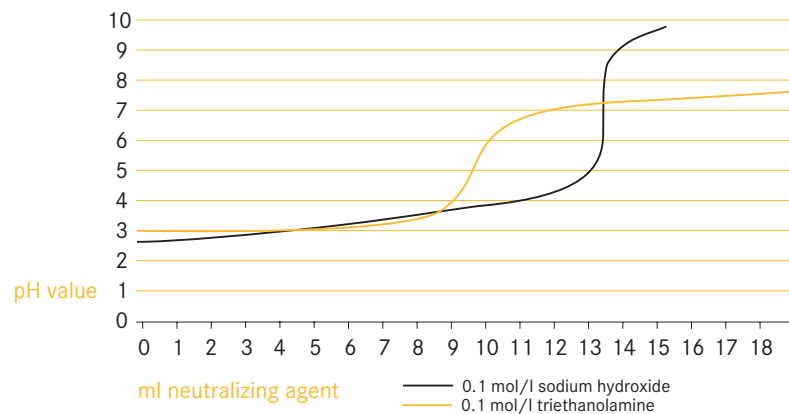
9.00% Neo Heliopan® AP

4.70% Potassium Hydroxide (30% solution in water)

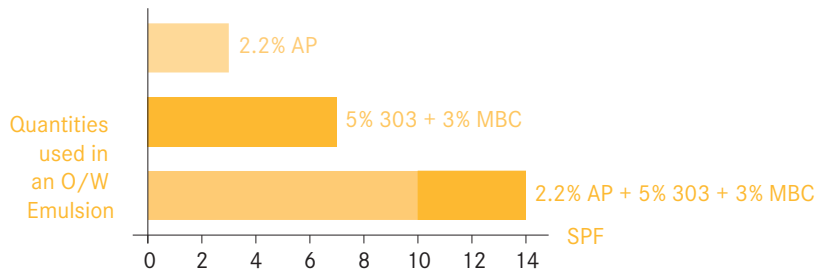
UV ABSORBANCE E 1%/1CM IN WATER (AS TRIETHANOLAMINE SALT)



NEUTRALIZATION CURVES



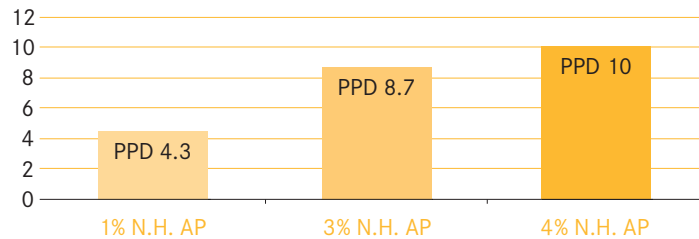
SYNERGISTIC EFFECT WITH OIL SOLUBLE UVB FILTERS



In an O/W emulsion the combination of Neo Heliopan® AP with the oil soluble sunscreen filters Neo Heliopan® 303 and Neo Heliopan® MBC caused an SPF increase of approximately 40%. The SPF was determined by a range finding study on 6 subjects following the COLIPA recommended protocol.

PERSISTENT PIGMENT DARKENING OF O/W EMULSIONS WITH Neo Heliopan® AP

In-vivo PPD Protection Factors



24-hour PPD protection factors of O/W emulsions were measured on subjects who were irradiated with a metal halide UVA light source equipped with a 2 mm Schott WG 340 and UG 11 filter to provide a UVA spectrum that closely approximated solar UVA radiation. An intensity of 40 mW/cm² was chosen in order to achieve reasonable irradiation times of the 3 subjects. This in vivo study gives a clear indication that Neo Heliopan® AP is a very effective UVA filter.

PATENT SITUATION

Neo Heliopan® AP is protected by numerous Symrise patents. When contemplating the use of Neo Heliopan® AP other patent applications from third parties should be evaluated.

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