



SIMPSSN™ BP-4

(INCI Name: **Benzophenone-4**)

**Water Soluble UVBA Filter and Absorber Active
Ingredient for
Cosmetic and Pharmaceutical Topical
Formulations**

**Product Instruction Sheet
(PIS)**



SIMP GROUP

Shanghai SIMP Biotechnology Co., Ltd.

Web site: www.simpbiotech.com

E-mail: simpbiotech@simpbiotech.com

Shanghai Headquarters	Tel: 86-21-5990 7606, 5990 7607	Fax: 86-21-5990 7602
Guangzhou Office	Tel: 86-20-6684 4588	Fax: 86-20-6684 4588
Beijing Office	Tel: 86-10-6447 5821, 6447 5822, 6447 5823	Fax: 86-10-6447 5819

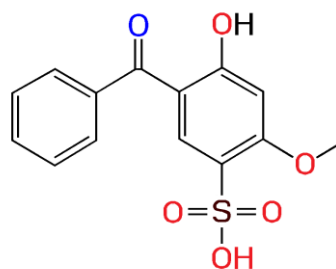
SIMPSSN™ BP-4

Water Soluble UV-BA Filter and Absorber for Cosmetic and Pharmaceutical Topical Formulations

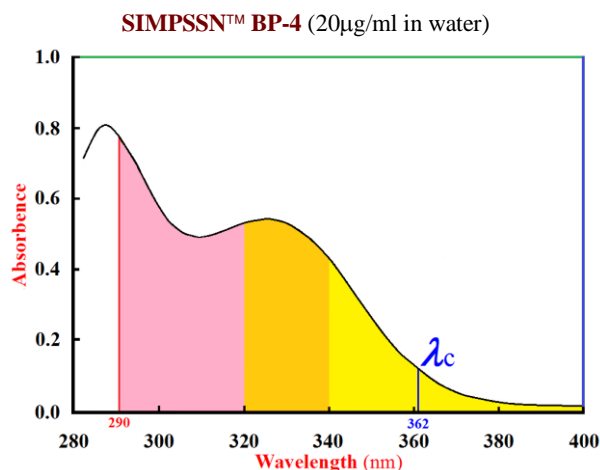
Product Information

Product Name:	SIMPSSN™ BP-4
INCI Name:	Benzophenone-4 (BP-4)
USP Name:	Sulisobenzone
Chemical name:	2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid
CAS No:	4065-45-6
EINECS No:	223-772-2
Formula:	C ₁₄ H ₁₂ O ₆ S
Molecular Weight:	MW = 308.31 g/mol

Structural formula:



UV Absorption spectrum:



Definition, Properties, Benefits and Applications

Description:

SIMPSSN™ BP-4 (Benzophenone-4) is a water-soluble version of **SIMPSSN™ BP-3**. It is a broad band spectrum **UV** filter which offers both **UV-A** and **UV-B** protection. U.S. approved use level: 5-10%. E.U. and China approved use level: up to 5%. Recommended at low levels (<0.5%) as a color protectant for products in clear packages.

EU-Functions: (INCI)

UV FILTER

UV ABSORBER {Cosmetics - CosIng [EC Regulation (v.2)] 2017}.

SIMPSSN™ BP-4 is an off white powder. **FDA** Category-1 sun screen, Approval Status: Globally approved.

In cosmetics and personal care products, **SIMPSSN™ BP-4** is used mostly in the formulation of bath products, makeup products, hair products, sunscreens and skin care products as the UV filter ingredients.

The Food and Drug Administration (**FDA**) has approved the use of Benzophenone-4 as safe and effective, over-the-counter (**OTC**) sunscreen ingredient. When used as a sunscreen ingredient in the United States, **Benzophenone-4** is called **Sulisobenzone**, and may be used at concentrations up to 10%.

Important:

The sulfonic acid group in the **structural formula** makes **SIMPSSN™ BP-4** soluble in water. The acid group can be neutralized by the usual personal care neutralizing agents, such as **TEA** or **NaOH**. The neutralizing agent makes no effect on **UV** absorption characteristics. However, if the product is overneutralized (pH 9), the absorption curve is shifted towards shorter wavelengths.

The quantities of neutralizing agent required to completely neutralize 100 g of **SIMPSSN™ BP-4** are as follows:

NaOH: approx. 13.0 g

TEA: approx. 50.0 g

The pH value of the resulting solutions lies between 5.6 and 6.0.

Applications:

UV radiation is responsible for various physiological effects in the skin, as a result of its high energy content. These effects include sunburn, the premature appearance of wrinkles, i. e. accelerated ageing of the skin and, with frequent intensive exposure, an increased risk of skin cancer. **SIMPSSN™ BP-4** and other **SIMPSSN™ UV** filters provide vital protection for the skin against these harmful effects of **UV** radiation. They are now increasingly being used not only in sun preparations but also in other skin cosmetics such as day creams.

The use of **SIMPSSN™ BP-4** and other **SIMPSSN™ UV filters** to protect the skin is subject to legislation in many countries. The concentrations of **UV** filters in sun preparations depend on the desired degree of protection, measured in terms of the sun protection factor (**SPF**). Commonly, organic **UV** filters are combined with micro pigments in products with a high **SPF**. They can also be used together with radical scavengers, e. g. sodium ascorbyl monophosphate, vitamin E or vitamin E acetate which provides additional passive sun protection.

In skin protection:

As **SIMPSSN™ BP-4** is globally approved for skin protection, and used as an **UV A** and **UV B** absorber especially for water soluble formulations. It is widely used as a sunscreen agent in cosmetics, shampoos, skin care products, hair care products etc.

A combination of an oil-soluble **UV** filter, e. g. **SIMPSSN™ BP-3**, **SIMPSSN™ DHHB** or **SIMPSSN™ OMC** and a water-soluble **UV** filter, e. g. **SIMPSSN™ BP-4** are recommended for the highest sun protection factors (**SPF** and **PFA**).

Protecting the hair:

Both the ultraviolet and visible components of sunlight have tangible effects on the hair in that they bleach it and make it brittle. As has been demonstrated in studies, it is possible to provide protection against these effects with **UV** filters. Broad-band filters such as the **SIMPSSN™ BP-4**, **SIMPSSN™ BP-3** and **SIMPSSN™ UVAB filters** are particularly suitable and can be used in hair-care products such as gels, setting lotions, normal and gloss hair sprays.

Protecting sensitive products:

UV filters can be used in cosmetics to protect the colorants against fading, to improve the stability of fragrance oils and active constituents against oxidation and to stabilize the viscosity of gels and shampoos. It is always necessary to add a **UV** filter if the cosmetic product is exposed to **UV** radiation, as is the case when the packaging is transparent. The protection of products usually requires concentrations of 0.05 - 0.5%, rather less than for skin protection. In these concentrations, the **SIMPSSN™ BP-4** and other **SIMPSSN™ UV** filters are generally not subject to legislation (though such legislation as exists must be observed), i. e. all the **SIMPSSN™ UV filters** can, in principle, be used to protect products against **UV** radiation.

Tests have shown that **SIMPSSN™ BP-4** stabilizes the viscosity of gels based on polyacrylic acid (Carbopol, Pemulen) when they are exposed to **UV** radiation. Concentrations as low as 0.1% provide good results.

The **SIMPSSN™ BP-4** is particularly used in the colorant, the fragrance or the active ingredient against the harmful effects of **UV** radiation for water soluble formulations and emulsions.

Note:

A photostabilizer and sunscreen agent used for its ability to absorb **UV** rays. It helps prevent the integrity of other cosmetic ingredients from deteriorating under the sun. Though **SIMPSSN™ BP-4** covers **UV-B** and short **UV-A (UV-A2)** range rays, it's an inadequate sunscreen agent when used alone. For this reason, it is often used in conjunction with other sun protecting ingredients. It's used in a variety of personal care products like sunscreen, nail polish, lotion/cream and lipstick.

It is recommended that **SIMPSTB™ series products (photostabilizers)** are more suitable to protecting the sensitive products in formulations.

It must be noted that **SIMPSSN™ BP-4** is not compatible with Mg salts, particularly in W/O emulsions. The use of **SIMPSSN™ BP-4** in fine particle respirable aerosols is not recommended.

SIMPSSN™ BP-4 has a yellow color that becomes more intensive in the alkaline range and may alter the hue of colored solutions.

Important:

It is strongly recommended that **SIMPSTB™ WOSD-850 series products (Photostabilizers)** are much more suitable to protecting the sensitive products in formulations both water and oils soluble.

Use level: (W/W) **(National regulations have to be observed)** ≤ 5%.

Mostly in sun care formulations: 1-4%.

The concentration recommended is 2-3%.

As the Photostabilizer to protect the sensitive products in formulations:

0.05-0.5 %; generally: 0.1-0.3%.

REGULATIONS:

SIMPSSN™ BP-4 is approved world-wide. Concentration maximum varies according to local legislation.

Approval status:

EU	China	Australia	USA	Japan
+ (5%)	+ (5%)	+ (10%)	+ (10%)	+ (10%)

Max. amounts: (W/W)

+ = Approved as a sunscreen agent (with max. concentration)

SIMPSSN™ BP-3 [INCI Name: Benzophenone-4 (**BP-4**)] is approved for use in Europe by the European Union's Scientific Committee for Cosmetic Products & Non-Food Products. It is also approved in China, Canada by Health Canada, in Australia, Brazil, South Africa, the Asian states and other countries.

It is approved for use in the **USA** by the Food and Drug Administration. It's permitted in Japan.

Toxicological Information

Toxicology:

The **SIMPSSN™ BP-4** has been toxicologically assessed for its suitability in cosmetic preparations. On the basis of information at our disposal and provided that the recommended concentrations and fields of application are adhered to, there is no evidence of any toxicological risk associated with their use.

Acute toxicity:

LD₅₀ / oral / rat: ≥ 3500 mg/kg (BW).

LD₅₀ / dermal / rabbit: ≥ 5000 mg/kg (BW).

Sensitization:

Primary skin irritation / rabbit / 5% soln. **SIMP** test: non-irritant.

Primary mucous membrane irritation / rabbits' eyes / **SIMP** test: slightly-irritant.

Safety:

SIMPSSN™ BP-4 can be safely handled without any irritation caused to the skin at recommended use level. Read and understand the **Material Safety Data Sheet (MSDS)** before using or handling this product.



Technical Information

Properties & Specification:

Appearance:	Pale yellow to yellowish fine crystalline powder; Almost odorless or very weak characteristic odor		
Assay:	≥ 98		% (W/W/HPLC)
Melting Point:	≥ 106		°C
Density:	0.90		g/cm ³ (25°C)
Bulk density:	~ 800		kg/m ³ (25°C)
Solubility:	Soluble in water. Soluble in ethanol and some of organic solvents.		
Log POW:	-4.6	(Octanol/water partition coefficient)	

Note:

The properties and specification in detail also can be seen on **TDS** ('**Technical Data Sheet**') of **SIMPSSN™ BP-4**. A '**Technical Data Sheet**' (**TDS**) of the product is available upon requirement.

“Product Specification or Quality Standards” — Please see the **COA** (**Certificate Of Analysis**) from the product **SIMPSSN™ BP-4** of the **SIMP**, and / or **order on agreement !**

The Quality of the product **SIMPSSN™ BP-4** meets the requirements from the **STSC** [**STSC** = 《**Safety and Technical Standards for Cosmetics**》 Version 2015, **China**] and / or **EU** and the like.

Solubility:

Soluble in water.
Soluble in ethanol and some of organic solvents.

Solubility of SIMPSSN™ BP-4 (neutralized with TEA) in different solvents at 20°C			
Solvent	Concentration	Solvent	Concentration
Water	approx. 34%	Propylene Glycol	approx. 15 %
Ethanol	approx. 2 %	—	—



Other Information

Package:	Net: 25/40kg/Drum <i>or order on agreement !</i>
Storage:	Keep tightly closed, light resistant containers in a dry and cool place.
Stability:	The minimum storage time for the SIMPSSN™ BP-4 in the original sealed containers is at least 2 years.
Shipping / Handling:	National legislation. No restrictions. See Material Safety Data Sheet (MSDS)

Order Information

A. Product Trade Name:	SIMPSSN™ BP-4
B. Package:	Net: 25/40 kg /carton (drum) lined a PE bag. <i>or order on agreement !</i>

TDS & MSDS

The 'Technical Data Sheet' (TDS) and 'Material Safety Data Sheet' (MSDS) of the product also is available on requirement.

Different reference formulations with **SIMPSSN™ BP-4** are available and can be sent on request.

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.

Contact us and credit:

SIMP GROUP
Shanghai SIMP Biotechnology Co., Ltd.
General Editor: Z.M.Jiang / Dec. 2020
Address: Shang-xue Road 229 (Feng-mao Road 580), Jiading District, Shanghai 201 801, CHINA
Web Site: www.simpbiotech.com
E-mail: simpbiotech@simpbiotech.com
Tel.: ☎ 86-21-5990 7606, 5990 7607
Fax: ☎ 86-21-5990 7602
Guangzhou Office: ☎ 020-6684 4588
Beijing Office: ☎ 86-10-6447 5821, 6447 5822, 6447 5823



Advice:

The information and statements presented herein, while not guaranteed, were prepared by technical personnel and, to the best of our knowledge and belief, is true and accurate as of the date hereof.

Before using one of these products of **SIMP** GROUP COMPANIES, read, understand and comply with the information and precautions in the **Product Instruction Sheet (PIS)**, the **Technical Data Sheet (TDS)**, the **Material Safety Data Sheets (MSDS)**, label and other literature about the product. No warranty, representation or guarantee, express or implied, is made regarding accuracy, performance, stability, reliability or use. This information is not intended to be all-inclusive, because the manner and conditions of use, handling, storage and other factors may involve other or additional safety or performance considerations. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information, products or vendors referred to herein. **NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.** Nothing herein is to be taken as permission, inducement or recommendation to practice any patented invention without a license.

Note

SIMPCARE, SIMPSOL, SIMPCIDE, SIMPREPT, SIMPSSN, SIMPSTB and the like are registered trademarks of the **SIMP** GROUP COMPANIES.

According to
《Safety and Technical Standards for Cosmetics》(STSC) Version 2015, China.
And Regulation (EC) No. 1907/2006

General Editor: Z.M.Jiang / Dec.2020 revised from the **SIMP**

