

# Hydrosulfite (Dithionite)

Safe handling



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## Note

The recommended safety measures apply to:

Hydrosulfite Conc. BASF  
Hydrosulfite Conc. BASF N  
Hydrosulfite F Conc. BASF  
Hydrosulfite FE Conc. BASF  
Hydrosulfite P Conc. BASF  
Hydrosulfite PF Conc. BASF  
Hydrosulfite PFS Conc. BASF

and analogously to:

Rongal® HT  
Rongal PS  
Burmol®  
Blankit® types

BASF AG supplies these products in steel drums with plastic liners and in 1- and 2-m<sup>3</sup> bulk containers.

® = Registered trademark of BASF Aktiengesellschaft

Hydrosulfite has been available commercially for many decades. It has been manufactured by BASF since 1905.

Provided that it is handled properly, hydrosulfite can be used safely and without risk. Proper handling of hydrosulfite means observing the information and safety advice provided in this leaflet.

## 1 General properties, storage and handling

Hydrosulfite is a white, crystalline powder containing more than 88 % sodium dithionite,  $\text{Na}_2\text{S}_2\text{O}_4$ . The powder also contains sodium sulfite, sodium disulfite, sodium sulfate and soda.

Hydrosulfite is subject to the provisions of the German Hazardous Substances Ordinance (Gefahrstoffverordnung) and must be labelled according to Annex I of the EC "Dangerous Substances" Directive as follows:

Xn – Harmful

R7 – May cause fire

R22 – Harmful if swallowed

R31 – Contact with acids liberates toxic gas

S3 – Keep in a cool place

S7 – Keep container tightly closed

S8 – Keep container dry

S26 – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S28 – After contact with skin, wash immediately with plenty of water

S43 – In case of fire, use large quantities of water

Hydrosulfite must be stored under cool (i. e. room temperature), dry conditions.

Decomposition always occurs if the powder is heated to a temperature of over 120 °C. In unfavourable circumstances (traces of moisture in the product or elevated product temperatures over a long period), decomposition may begin at 80 °C.

Decomposition occurs in the presence of even traces of moisture. Elementary sulfur is produced, which ignites in air to form sulfur dioxide.

Hydrosulfite is therefore classified as a hazardous substance for transport purposes (German Hazard Category 4.2, 13B).

Hydrosulfite must not be transported or stored together with oxidizing agents, such as sodium nitrite, sodium nitrate, ammonium nitrate, hydrogen peroxide, sodium chlorite, sodium peroxide, or chlorates.

## 2 BASF safety measures before shipment

BASF's hydrosulfite production is subject to constant quality control.

BASF bulk containers are inspected by the Technical Control Board (TÜV).

The product is loaded dry and under cover.

The product is shipped only in covered lorries, railway wagons and containers by selected, BASF-approved haulage firms.

## 3 Storage and handling recommendations

The products must be protected from moisture during unloading.

Hydrosulfite must be stored under cool, dry conditions.

The hydrosulfite storage area should contain no water supply points. Hydrosulfite should never be stored or used under a sprinkler system, since activation of such a system increases the risk of decomposition.

Product should only be withdrawn from drums with a dry scoop. The drums should then be resealed.

Bulk containers should be stored 20 cm apart. The containers may be stacked two high.

Before product is removed from containers, these must be temperature-conditioned to prevent condensation from forming and causing decomposition of hydrosulfite.

Because of hydrosulfite's tendency to consume oxygen, the interior of containers (including customers') that have held hydrosulfite or its solutions may be inspected only if an adequate supply of oxygen is guaranteed.

Containers should be emptied by opening only the safety device on the bottom discharge outlet and the discharge valve. The manlid and relief vents should remain closed to minimize the risk of product decomposition during emptying.

The hydrosulfite feed should cut off automatically if the water supply to the dissolving unit fails.

If production is stopped for more than five hours, the hydrosulfite holding bin should be emptied. For longer interruptions (e. g. the weekend), the container should be disconnected from the dissolving unit.

BASF offers a consulting service for assessing hydrosulfite storage areas.

BASF recommends the use of SO<sub>2</sub> detectors for signalling hydrosulfite decomposition and provides names of appropriate manufacturers on request.

BASF offers advice in the construction and operation of dissolving and metering units.

## 4 Decomposition by water

If moisture enters a hydrosulfite container, the product in the affected area will start to decompose and release heat. The heat released accelerates decomposition. Since the reaction releases SO<sub>2</sub> gas, the pressure in a closed container may build up to a dangerously high level.

If decomposition occurs in the interior of the container, it can produce, in addition to SO<sub>2</sub>, elementary sulfur, which may ignite.

The smouldering process indicated here is not normally observed immediately after hydrosulfite has become moist, but only after some hours have elapsed. The temperature of the decomposing product may reach 200 °C, initiating further decomposition.

Do not store damaged containers, e. g. those with a perforated wall through which product can leak out and/or moisture can penetrate. Instead, the contents should be dissolved in a large excess of water.

## 5 Measures to be taken in the event of decomposition

There are two ways of dealing with a smouldering or burning hydrosulfite container:

- either allow it to burn out or
- dissolve the burning product in copious amounts of water.

Protective clothing should be worn during disposal of hydrosulfite. Eyes should be protected by tightly fitting goggles, and rubber or plastic gloves, aprons and boots should be worn.

For escape purposes, gas masks with an ABEK filter should be worn. Where large quantities of SO<sub>2</sub> are being released, breathing apparatus should be used.

As soon as decomposition is detected (strong SO<sub>2</sub> odour, deformation of drums or IBCs, warming of container walls), the containers in question must be opened. Since pressure build-up may have already occurred, this should be performed with great care. It is recommended that holes be punched with a spike or with the fork of a fork-lift in any containers that cannot be opened in time. The worker concerned should take care to avoid being struck by a jet of escaping product.

If a hydrosulfite container shows signs of initial decomposition (a strong smell of SO<sub>2</sub>, possible warming of the sides of the container), it should immediately be taken out into the open away from other containers, providing this can be done without danger. Otherwise the pressure must be released before the container is moved. The cover and bottom of the container are then removed and the product dissolved in a large quantity of water from one or more fire hoses. Soda or caustic soda can be added to the solution to reduce the SO<sub>2</sub> odour. The usual protective clothing should be worn when handling caustic soda.

Small fires can be put out with fire extinguishers (dry powder or carbon dioxide) or smothered with sand or cement. The product must then be disposed of.

If the amount of decomposing product is not too large, an attempt should be made to isolate it completely and dissolve it in plenty of water. Fire extinguishers are not suitable for controlling hydrosulfite decomposition.

Since hydrosulfite is an oxygen-consuming substance, its solutions, and the extinguishing water from hydrosulfite fires, should only be discharged into a suitable waste-water treatment plant. Local waste-water regulations must be observed.

No attempt should be made to cool a container of decomposing hydrosulfite by spraying it with water. First, this will generally not stop decomposition once it has started, but only slow it down; and second, there is too great a risk of water also penetrating adjacent containers.

## 6 First-aid measures

Change contaminated clothing immediately.

Skin: rinse off immediately with plenty of water.

Eyes: rinse thoroughly for 15 min under running water while holding the eyelids open. Obtain medical attention.

If swallowed, induce the patient to drink large quantities of water.

Seek immediate medical attention in all cases of contact with the eyes, inhalation or swallowing.

Where there is a risk of the patient losing consciousness, he or she should be laid down and transported in the recovery position. If necessary, apply mouth-to-mouth resuscitation.

## 7 Information

Information may be obtained from the BASF AG Fire Brigade, Ludwigshafen, Germany:

Tel. +49 621 60-43333

## 8 Legal Note

The transport, storage, application and handling of hydrosulfite are subject to the laws of the countries in which these activities take place (chemical laws, hazardous goods laws, transport laws, etc.) These laws must always be strictly observed by the user, irrespective of the information provided in this leaflet. In so far as legal regulations are mentioned in this leaflet, they refer to the laws of the Federal Republic of Germany.

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**BASF Aktiengesellschaft**  
**Geschäftseinheit Papierchemikalien Europa**  
Ludwigshafen – Germany

Tel.: (49) 621 60 99842      Fax: (49) 621 60 99934  
Tel.: (49) 621 60 0

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**BASF Aktiengesellschaft**  
**Regional Marketing Europe**  
Ludwigshafen – Germany

Tel.: (49) 621 60 4 54 81      Fax: (49) 621 60 4 58 87  
Tel.: (49) 621 60 0

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**BASF Aktiengesellschaft**  
**Regional Marketing Asia**  
Singapore

Tel.: (65) 432 34 00      Fax: (65) 432 34 34

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**BASF Corporation**  
**Regional Marketing NAFTA**  
Charlotte, NC – USA

Tel.: (1) 704 392 43 13      Fax: (1) 704 393 36 49

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**BASF S.A.**  
**Regional Marketing South America**  
São Bernardo do Campo/São Paulo – Brazil

Tel.: (55) 11 751 22 33      Fax: (55) 11 751 69 89

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**BASF Aktiengesellschaft**  
**Regional Marketing Eastern Europe, Africa and West Asia**  
Ludwigshafen – Germany

Tel.: (49) 621 60 4 57 78      Fax: (49) 621 60 2 04 22  
Tel.: (49) 621 60 0

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