

Potassium Monopersulfate (KMPS) - Universal Oxidizer

Overview

[Potassium Monopersulfate](#) (KMPS) is a triple salt with the formula $2\text{KHSO}_5 \cdot \text{KHSO}_4 \cdot \text{K}_2\text{SO}_4$ (potassium hydrogen peroxymonosulfate sulfate). It is a strong oxidizer suitable for a wide range of applications. Unlike other oxidizing agents, KMPS has the particular advantage of not containing any halogens. KMPS oxidation does not carry the risk of forming hazardous halogenated byproducts. [KMPS is supplied as a stable white powder](#) with a minimum 4.5% oxygen content, high quality consistency, and a long shelf life under cool and dry conditions.

Stability

Aqueous solutions of KMPS are relatively stable when the pH of the product is unmodified. The stability is adversely affected by higher pH, especially pH values above 7. Cobalt, nickel, and manganese are particularly strong catalysts for the decomposition of KMPS in solutions.

Applications

KMPS has a very wide variety of applications. The most known and distributed applications are shown below.

Swimming Pool Water and Ponds Treatment

KMPS is the ideal alternative to shock chlorination for the disinfection of [pools & ponds](#).

The advantages are that KMPS does not form chloramines, nor does it develop a chloramine odour. KMPS is an oxygen-based oxidant, that does not contain chlorine and thus cannot form chloramines.

KMPS does not form THMs (trihalomethanes), because its oxidation potential is based on oxygen, and not on chlorine. Thus, carcinogenic THMs, such as chloroform cannot be formed from KMPS.

KMPS increases the efficiency of chlorination. When KMPS is used, it continuously oxidizes any introduced contaminants, which prevents the consumption of residual free chlorine. This residual chlorine remains readily available for the extermination of pathogenic microorganisms without raising the chlorine level!

KMPS significantly improves water clarity and makes water sparkling clean and crystal clear.

KMPS protects surfaces. Despite being a very strong oxidant, that eliminates contaminants in pool water, it does not damage vinyl liners in pools and does not bleach surfaces!

Following KMPS treatment, swimming can resume after a short waiting period (several hours). No significant down time is required!

Unlike chlorine, KMPS is unaffected by UV light and therefore is particularly suited for both day and night applications.

Disinfection

[KMPS is an ANSI60 certified](#) chemical and can be widely used for the conditioning of drinking water.

KMPS is the active ingredient in formulations used for disinfection in animal husbandry, such as for poultry farming and stable disinfection. It works to suppress and prevent diseases such as foot and mouth disease, bird flu, and swine flu. KMPS is also used as a hard surface

disinfectant in hospitals or in other areas requiring increased hygiene standards.

Waste Treatment and Detoxification

KMPS solutions can oxidize pollutants in [lagoons](#), especially in waste streams containing sulfides, sulfites, amines, and other oxidizable organic compounds. Wastewater that contains high concentrations of cyanides (gold mining) can also be detoxified with KMPS. While hydrogen peroxide oxidizes only free cyanides, KMPS can also break down complex cyanides (except those of iron and gold) rapidly and completely. Furthermore, oxidation of cyanides with KMPS can prevent the formation of hazardous absorbable organic halides (AOX).

Denture Cleaning

One of the major applications of KMPS is denture cleansing. It acts as a very efficient bleaching and oxidizing agent. There are various formulations that excellently clean and disinfect dentures.

Metal Treatment and Metal Extraction

KMPS is a premium etching agent for the surface treatment of metals and alloys in the metal fabricating industry. When dissolved in water or in diluted sulfuric acid, KMPS forms micro-etching solutions for the preparation of non-ferrous metal finishes and can be used for the pre-cleaning of metal surfaces and the removal of passivating oxidized surface layers. Due to its high oxidizing power in aqueous solutions, KMPS can also be used for the extraction of metals and for their separation from ores. The same can be applied to the micro-etching of copper conductors in the production of printed circuit boards, yielding clean, uniformly etched, and oxide-free surfaces that match the highest demands in quality.

Re-Pulping of Paper

KMPS is used as active ingredient for chlorine-free formulations for the re-pulping of wet strength paper. In this process, polymers applied for paper production such as polyamide (PA) and polyamine-epichlorhydrin (PAE) are effectively oxidized by thermal activation alone.

KMPS can be used for other types of resins. Unlike sodium hypochlorite (NaOCl), KMPS does not form chlorinated compounds, such as AOX.

Pretreatment of Wool

In the textile industry, KMPS is a key agent for rendering wool shrink-resistant and non-felting. This oxidation process smoothens the surface of wool fibres.

Laundry Bleach

KMPS is an effective low-temperature non-chlorine bleach when formulated correctly. It can be used with colours when care is taken to completely dissolve it before contact with damp fabrics.

Treatment of Yeast

KMPS can be used for the selective elimination of undesired bacteria in yeast suspensions. The yeast itself is not damaged by this treatment when it is dosed appropriately.

Chemical Synthesis

KMPS is a very strong and selective oxidizing agent for different applications, substituting chlorine chemistry. In organic chemistry, such as pharmaceutical and agrochemical intermediates, KMPS works as a highly selective reagent for stereoselective dioxirane chemistry (epoxidation of olefins) and the selective oxidization of reduced nitrogen and sulfur groups.

Testing

In the absence of active chlorine, low concentrations of KMPS can be measured with a standard [DPD4 test kit](#). To obtain KMPS results in ppm, the test result must be multiplied by 5. KMPS in low concentrations (<20 ppm) can also be measured in the presence of active chlorine with the DPD4 test using Lamotte [MPS-OUT TesTabs](#) (available from [Osorno Store](#)).

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If you have any questions please contact:

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