United States Department of Agriculture
Agricultural Marketing Service | National Organic Program
Document Cover Sheet
https://www.ams.usda.gov/rules-regulations/organic/petitioned-substances

Document Type:

☒ **National List Petition or Petition Update**

A petition is a request to amend the USDA National Organic Program's National List of Allowed and Prohibited Substances (National List).

Any person may submit a petition to have a substance evaluated by the National Organic Standards Board (7 CFR 205.607(a)).

Guidelines for submitting a petition are available in the NOP Handbook as NOP 3011, National List Petition Guidelines.

Petitions are posted for the public on the NOP website for Petitioned Substances.

☐ **Technical Report**

A technical report is developed in response to a petition to amend the National List. Reports are also developed to assist in the review of substances that are already on the National List.

Technical reports are completed by third-party contractors and are available to the public on the NOP website for Petitioned Substances.

Contractor names and dates completed are available in the report.

enartis

Inspiring innovation.

May 15th, 2025

National List Manager

USDA/AMS/NOP, Standards Division

Attention: National List Manager

1400 Independence Ave, SW

Room 2642-So., Ag Stop 0268

Washington, DC 20250-0268

Dear National List Manager,

We, Enartis USA Inc., are submitting this petition to request the inclusion of potassium polyaspartate (KPA), on the National List under Section 205.605 (b) as a non-agricultural (nonorganic) substance permitted in or on processed products labeled as "organic" or "made with organic (specified ingredients or food group(s))."

KPA plays a pivotal role in modern organic winemaking by improving product stability while presenting significant qualitative, technological, environmental, and economic advantages over the materials and methods that are currently applied by the US wine industry. The inclusion of KPA on the National List supports the principles of organic agriculture, which aim to promote ecological balance, enhance soil and plant quality, and minimize the cost to the environment. By emphasizing KPA's role in reducing reliance on less environmentally friendly practices and its biodegradability and non-toxicity, the petition aligns with the broader goals of the OFPA to foster environmentally friendly farming and handling practices.

To the best of my knowledge this petition is complete, accurate, and meets the requirements as laid out in NOP 3011 Procedure: National List Petition Guidelines, and CFR § 205.600 Evaluation criteria for allowed and prohibited substances, methods, and ingredients.

Thank you for taking the time to review this petition, and please contact me if you have any questions.

Best Regards,

Enartis USA Inc.

Nick Sherry

nick.sherry@enartis.com (707) 508-6786

ITEM A

Item A.1 – National List Section: Section 205.605 (b): Nonagricultural (nonorganic) substances allowed in or on processed products labeled as “organic” or “made with organic (specified ingredients or food group(s)).”

Item A.2 – OFPA Category: N/A

Item A.3 – Inert Ingredients: N/A

ITEM B

Item B.1 – Substance Name: Potassium polyaspartate A-5D K/SD*

Item B.2 – Petitioner and Manufacturer Information:

USA: Nick Sherry
Enartis USA Inc.
7795 Bell Road,
Windsor, CA 95492

Italy: Enartis Srl.
Via Achille Grandi, 9
28066 Galliate, NO
Italy

Item B.3 – Intended or Current Use:

Potassium polyaspartate (KPA) is a bio-polymer composed of aspartic acid units. It is the potassium salt of polyaspartic acid, which is a biodegradable, water-soluble polymer derived from the amino acid aspartic acid.

KPA is primarily used as a stabilizer in the wine industry. Its main function is to prevent tartrate crystal precipitation in various types of wine, including red, white, rosé, sparkling, and fortified wines. This helps maintain the wine’s clarity and stability during storage and transportation, ensuring consumer acceptance of the product. While tartrates are not a danger to human health, formation of crystals can alter consumers quality perception, potentially creating commercial problems.

KPA is recognized by the Food & Drug Administration (FDA) as 'Generally Recognized as Safe' (GRAS): GRAS Notice 770 Agency Response Letter. KPA is permitted by the Alcohol and Tobacco, Trade and Tax Bureau (TTB) as a wine and juice treating material that has been administratively approved for continual use under CFR 24.250 at a maximum dose of 100 mg/L. The specifications for KPA used in winemaking are described in detail by the International Oenological Codex, compiled by the International Organisation of Vine and Wine (OIV).

Additionally, KPA is considered an environmentally friendly alternative to traditional stabilizers, as it is biodegradable and does not negatively impact the sensory properties of wine. While KPA is primarily known for its use in stabilizing wines, other similarly manufactured polyaspartic acid salts, such as sodium polyaspartate, also have applications in other industries due to their properties:

1. **Food Industry**: It can be used as a stabilizer and thickening agent in various food products, helping to improve texture and shelf life.
2. **Agriculture**: KPA can be used as a soil conditioner to improve water retention and nutrient availability for plants.
3. **Cosmetics**: It may be used in skincare products as a moisturizing agent due to its ability to retain water.
4. **Water Treatment**: Sodium polyaspartate is used in water treatment processes to prevent scale formation and improve water quality.

The adoption of polyaspartates in these industries is relatively recent, driven by its environmental benefits and effectiveness. Its biodegradability and non-toxic nature make it an attractive alternative to traditional chemicals.

Item B.4 – Intended Activities and Application Rate

Tartrate stabilization is an essential part of winemaking, for reasons of consumer perception, aesthetic quality, and storage stability; the latter being important to wine quality. The tartrate stabilization techniques available to winemakers can be sub-divided into subtractive and additive processes.

Subtractive processes include cold stabilization (with or without the addition of potassium bitrate as a seeding agent), ion exchange resins, and electrodialysis, all of which are physical processes. ZENITH UNO, a solution of Potassium polyaspartate A-5D K/SD*, sulfur dioxide (approximately 0.3%), and demineralized water, offers the following advantages over these processes:

- It is more environmentally sustainable: less consumption of power, water, and lower production of greenhouse gas.
- It is more respectful to wine quality: less risk of oxidation; better preservation of aromatics, color, and structure; no impact on wine sensory profile.
- Its application does not require investment in special equipment.
- The stabilization process with ZENITH UNO is quick and does not require skilled labor.
- KPA is highly effective at preventing potassium bitartrate crystal formation, ensuring long-lasting stabilization.

ZENITH UNO was developed by Esseco Srl - its application is patented in the US (Patent no. 10.508.258.B2 and the EU (Patent no. EP2694637B) – to use as an alternative to both subtractive and additive processes. Compared to other available stabilizing agents, or additive processes, such as carboxymethylcellulose, mannoproteins, gum Arabic and metatartaric acid, ZENITH UNO offers the following advantages:

- Is very effective and can be used to stabilize quite unstable wines.
- Assures a long lasting stabilizing effect, contrary to metatartric acid
- Does not impact wine filterability; no fouling during membrane filtration.
- In red wine, it does not react with color compounds, unlike CMC
- Is resistant to high temperatures, therefore it can be used in the stabilization of wines that undergo pasteurization.

Application Rates in wine: Up to 100 mL/hL (maximum dosage permitted in EU and US). 100 mL/hL contributes about 4 mg/L of SO2 to the wine.

KPA inhibits the crystallization of potassium bitartrate in wine by forming a protective layer around potential crystal nuclei, which consist of tartaric acid and potassium ions. This layer prevents the ions from aggregating and forming crystals.

Item B.5 – Manufacturing Process

Enological KPA is a synthetic biopolymer manufactured from two raw starting materials; L-aspartic acid, and caustic potash liquid 45% (potassium hydroxide). L-aspartic acid is produced by fermentation. The L-aspartic acid monomer is converted into polysuccinimide, an insoluble compound, via a thermal process. During this step, racemization occurs resulting in both D- and L-aspartic acid in the final product. KPA is obtained by treating polysuccinimide with aqueous potassium hydroxide under controlled conditions, leading to hydrolysis, an opening of the succinimide rings. A 40% solution of potassium polyaspartate at 8.3 pH is produced, which goes through a spray drying phase, resulting in a light tan powder at 92-95% dry matter.

A schematic overview of the production process for potassium polyaspartate is provided below (Figure 1).

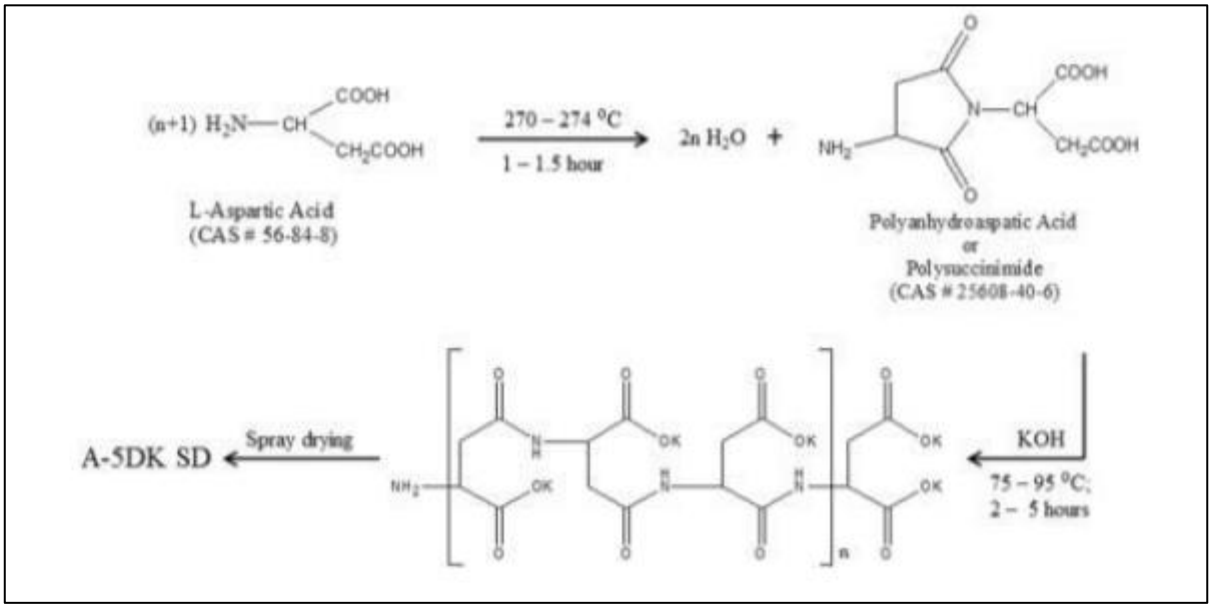

Figure 1. Schematic overview of potassium polyaspartate manufacturing process (source: GRAS Notification No 770 for the use of Potassium Polyasparte in Wine)

Potassium hydroxide, necessary in the production of KPA is permitted for use in section § 7 CFR 205.605(b)(26) of the National List regulations, as an allowed synthetic with limitations for use in lye peeling vegetables and fruits.

Item B.6 Ancillary Substances

Demineralized water – A solvent used to make a solution of potassium polyaspartate. Demineralized water, also known as deionized water, is purified to have the mineral ions removed and is used for its purity.

Sulfur Dioxide (E220) – An antifungal preservative and antioxidant that is Included in the National List §205.605(b). It enhances product stability and provides microbial control to the KPA solution.

The following ancillary substances are used in conjunction with KPA to provide various technical effects, which enhance the overall stability of the finished wine:

Gum Arabic – A non-organically produced substance included on the National List § 205.606(j). A dried exudate from *Acacia Verek* and *Seyal* trees in Sudan, Africa, it is a complex mixture of glycoproteins and polysacharrides that are soluble in water. In the wine industry and food industry gum Arabic is used as a stabilizer. In conjunction with KPA gum Arabic Verek is used to stabilize color in red wine.

Bakers Yeast Mannoproteins – Derived from the cell walls of *Saccharomyces cerevisiae* via enzymatic or thermal extraction, mannoproteins are primarily used as stabilizers in various food and beverage applications. Being a yeast product, they fall under CFR §205.605 (a)(30). Mannoproteins are added to a KPA solution designed for sparkling wines to preserve bubble stability and improve foamability.

Inactivated Yeast – Yeast is a non-agricultural substance on the National List, §205.605(a)(30). It is derived from yeast fermentation processes, and is used as a component of an Enartis product containing KPA that is used for stabilization.

These ancillary substances improve the functionality of potassium polyaspartate without compromising its compliance with organic production standards.

Item B.7 Previous Reviews

No additional reviews by state, private certification programs, or other organizations relating to KPA could be found after an extensive search.

Item B.8 Regulatory Authority

The Food & Drug Administration (FDA):

The FDA had "no questions regarding Enartis' conclusion that potassium polyaspartate is GRAS under its intended conditions of use." in its Agency Response Letter to GRAS Notice No 000770 requesting its "use as a stabilizer preventing potassium tartrate precipitation in wine at levels up to 300 mg/L."

The Alcohol and Tobacco Tax and Trade Bureau (TTB):

The TTB came to a preliminary conclusion to allow KPA to be used, at a maximum level of 100 mg/l of wine based on GRAS Notice No. GRN 000770, as a "wine and juice treating material that has been administratively approved for continual use," to stabilize wine by preventing tartrate crystal precipitation, under 27 CFR 24.250.

Potassium Polyaspartate: To stabilize wine by preventing tartrate crystal precipitation.	The amount used must not exceed 100mg/L of wine. GRAS Notice No. GRN 000770.	Preliminary conclusion, as of February 7, 2020, allowing use of potassium polyaspartate.

Source: TTBGov - Treating Materials

United States Environmental Protection Agency (US EPA):

Both components used to manufacture KPA, Potassium hydroxide and Aspartic Acid are on the EPA's Safer Chemicals Ingredients List with a green circle indicating that "*The chemical has been verified to be of low concern based on experimental and modeled data.*" (EPA, 2023).

Sodium polyaspartate, which is manufactured via the same process, except sodium hydroxide is used, is also denoted by a green circle on the Safer Chemicals Ingredients List.

Currently, KPA is not listed in the EPA's Safer Chemical Ingredients List, however the EPA very recently exempted KPA under section 408 of the Federal Food, Drug, and Cosmetic Act (FFDCA) 21 U.S.C. 346a, from the requirement of a tolerance limit when used as an inert ingredient (complexing agent) in pesticides, at a maximum formulation of 10%, pre-harvest (Federal Register, 2025).

Item B.9 Chemical Abstracts Service (CAS) Number and Product Labels

Chemical Abstracts Services Registry Number: *Potassium polyaspartate CAS No. 64723-18-8*

Product Label:

Please refer to Appendix A

Item B.10 Physical and Chemical Properties

Overview of KPA: KPA (international Numbering System for Food Additives [INS] 456) is a versatile biopolymer and is the potassium salt of polyaspartic acid, produced from L-aspartic acid, a naturally occurring amino acid in wine. Enological KPA typically contains around 70% β-peptide bonds and 30% α-peptide bonds, and is a polydisperse polymer with a number-average molecular weight of approximately 1000 Da, and weight-average molecular weight around 5000 Da (WHO Additive Series: 78 Safety Evaluation of certain Food Additives, Geneva, 2020). KPA limits the precipitation of tartaric salts by linking to the potassium cation, thereby acting as a colloid protector.

The physical and chemical properties of the KPA solution Zenith Uno are specified by the OIV (COEI-1-POTPOL Potassium Polyaspartate). Table 1. provides the specifications available on the 'Certificate of Analysis' (CoA) for Zenith UNO,

Parameter	Unit	Specification	Method
Appearance	na	Clear or lightly opalescent solution	E 202.01
Colour of product	na	Yellowish	E 202.01
pH (20 °C)	na	3,2 – 3.8	E 202.07
SO2 contents	%	0.15 – 0.40	E 202.08
Composition	na	Comply	E 202.17
Iron (Fe)	mg/kg (dry mat.)	</= 10.0	E 202.10
Arsenic	mg/kg (dry mat.)	</= 3	E 202.11
Lead (Pb)	mg/kg (dry mat.)	</= 2	E 202.12
Mercury (Hg)	mg/kg (dry mat.)	</= 1	E 202.13
Cadmium (Cd)	mg/kg (dry mat.)	</= 1	E 202.14

Table 1. Values shown on a typical ZENITH UNO 'Certificate of Analyses.'

Unique Properties of Potassium Polyaspartate: KPA stands out within the stabilization family due to its distinctive and beneficial properties, which have led to its wide adoption across various industries, including winemaking. These properties include:

- Biocompatibility and biodegradability ensure that KPA is safe for use in food and beverage applications, aligning with environmental sustainability goals.
- Non-toxicity and non-allergenicity makes KPA a safe choice for consumers, particularly important in products intended for human consumption.
- KPA is synthesized from natural and renewable raw materials.
- There is no sensory effect on wine taste or aroma, even at high doses.
- It does not react with color and can be used in white, rose, red, and sparkling wine.

a) Chemical Interactions with other substances, especially substances used in organic production.

A study by Bosso et al. (2020) demonstrated that KPA does not show any adverse reactions when used on wines clarified with bentonite, gelatin, casein or plant proteins, and further states that no precautions need to be taken when using tannins or gum Arabic with a wine to be treated with KPA.

(b) Toxicity and environmental persistence

No reports or data could be found to determine the toxicity or environmental persistence of KPA. It is not listed by the US National Toxicology Program (US NTP), nor on the US EPA website (see Section B.7).

The biodegradability of various polyaspartic acids was evaluated using the OECD 301C method; results suggested that complete biodegradation of polyaspartic acid is possible (Kumar, 2012). The same author highlighted a study in which sodium polyaspartate when synthesized without a catalyst was only 70% biodegradable, while sodium polyaspartate synthesized in the presence of Phosphoric acid was fully biodegradable.

A report from the Oil Fields Chemicals 7th International Symposium concluded that thermal polyaspartates were highly biodegradable and non-toxic and are produced by an environmentally benign manufacturing process (Ross & Ravenscroft, 1996).

NanoChem Solutions (2013) carried out an Environmental Assessment of sodium polyaspartate as a food contact substance to be used in packaging, determining that there are no significant impacts from its use or disposal, and it is not of toxicological concern. The FDA concurred that there was 'no significant impact' and added it to the list of food contact substances (FDA, 2013).

c) Environmental impacts from its use and/or manufacture

The materials used in the manufacture of KPA are all widely used in the chemical and food industries.

Potassium hydroxide, necessary in the production of KPA is permitted for use in section § 7 CFR 205.605(b)(26) of the National List regulations, as an allowed synthetic with limitations for use in lye peeling vegetables and fruits.

The STABIWINE Report (2015), a European project (FP&_SME_AG, n314903) focusing on the use of biopolymers for the sustainable stabilization of quality wines, found that of all the tartrate stabilization techniques applied by EU wineries, KPA had the lowest carbon and water footprint, and was the most easily adoptable practice for smaller producers, among other reported positive characteristics.

The Nanochem Environmental Assessment for the sodium salt of polyaspartic acid (2013) provides a detailed assessment of the environmental impact of sodium polyaspartate from production to its fate in the environment. Including it's ecotoxicity. The assessment concludes that there are no environmental concerns and accordingly no necessary mitigation measures to be enforced concerning its manufacture or disposal.

The US EPA recently exempted KPA from the requirement of a tolerance limit when used as a complexing agent (inert ingredient) in pesticides, further demonstrating its benign nature (Federal Register, 2025).

d) Effects on human health

A scientific opinion on the safety of potassium polyaspartate (A-5D K/SD) for use as a stabilizer in wine, carried out by the European Food Safety Authority Panel on Food Additives and Nutrient Sources added to Food (ANS), and following standards set by the Organization for Economic Co-operation and Development (OECD), determined that there was no safety concern from the proposed use and use levels of potassium polyaspartate (EFSA, 2016).

Colombo et al (2019) provide further experimental data addressing concerns that the binding properties of KPA may reduce microelement bioavailability when used as a stabilizer in wine, concluding that the effect must be considered negligible.

A safety evaluation of potassium polyaspartate prepared by the Joint FAO/WHO Expert Committee on Food Additives (JEFCA, 2020) suggests that the systemic bioavailability of KPA is low and it would likely not cleave to the stomach or intestinal lining, and that there were no concerns for genotoxicity. The Committee concluded that there were no safety concerns with the use of KPA in wine at the proposed use level of 300 mg/L.

The United States Food and Drug Administration (US FDA) had no questions regarding Enartis' conclusion that potassium polyaspartate is Generally Recognized as Safe (GRAS) under its intended conditions of use (GRAS Notice GRN 770 Agency Response Letter).

e) Effect on soil organisms, crops, or livestock.

No data or research could be found on the specific effect of KPA on soil organisms, crops, or livestock, Recent studies have highlighted the beneficial effects of polyaspartic acid (with potassium polyaspartate being its potassium salt) in agriculture. Deng et al. (2019), Ji et al. (2021), and Liu et al. (2023) have all contributed to this body of research. Specifically, Deng et al. (2019) found that the combination of polyaspartic acid-urea and optimized nitrogen management significantly improved the grain nitrogen concentration in rice, addressing malnutrition issues.

The effect of polyaspartic acid and different dosages of controlled release fertilizers on nitrogen uptake, utilization, and yield of maize cultivars also points to the promising application of polyaspartic acids in agriculture (Ji et al., 2021). A 2023 study by Liu et al. found that urea enhanced with higher molecular weight polyaspartic acid significantly increased wheat yields and. nitrogen use efficiency.

Another recent study found that polyaspartic acid improved rice yield, nitrogen utilization, and potassium absorption. The research implied that polyaspartic acid improves bacterial diversity and reshaped the bacterial community in soil, optimized bacterial interrelationships, and provided a beneficial shift of soil microbiomes for rice cultivation (Liu et al, 2023)

Item B.11 Safety Information

To our knowledge, a specific NIEHS substance report on potassium polyaspartate does not exist. However, the safety of KPA is well-documented in peer-reviewed studies and regulatory approvals, including:

Food Standards of Australia and New Zealand (FSANZ) - KPA was adopted in the Australian and New Zealand wine industries following food technology, hazard, and dietary exposure assessments carried out by FSNAZ (2018).

Health Canada – A premarket safety assessment, carried out by Health Canada's Food Directorate, considered information relating to the allergenicity, chemistry, microbiology, nutrition, toxicology, and efficacy of KPA (Health Canada, 2020). The results supported the proposed use in the wine, and it was consequently added to the 'List of Permitted Food Additives with Other Accepted Uses' in 2021 (Health Canada, 2021).

European Union (EU) – Following the European Food Safety Authority scientific opinion on the safety of KPA, the International Organization of Vine and Wine (OIV) accepted the use of KPA for treating tartrate instability in wine in Resolution OIV-OENO 543-2016 .

The European Union adopted Regulation EU 2017/1399 on 28 July 2017 authorizing the use of KPA for use in stabilizing wine against tartrate precipitation at a maximum rate of 100 mL/hL.

Joint FAO/WHO Expert Committee on Food Additives (JEFCA) - During the 87th meeting of JEFCA potassium polyaspartate was evaluated and the committee concluded that KPA at the maximum proposed use level of 300 mg/L was not of any safety concern. Specifications were prepared and are available on the GFSA Online Database of Food Additives (FAO and WHO, 2025).

Codex Alimentarius:

Potassium polyaspartate was recently added to the Code Alimentarius, updated up to the 47th Session of the Codex Alimentarius Commission (2024) under 14.2.3 Grape Wines with a maximum addition of 100 mg/kg (FAO, 2025). The Codex Alimentarius is made up of 189 members.

Please refer to Appendix B for the Safety Data Sheet (SDS) of ZENITH UNO. These findings confirm that KPA is safe for human and environmental health, aligning with organic standards.

Item B.12 Research Information

In researching this petition to have KPA included on the National List, it should be noted that, due to its relatively novel nature in the industry, most of the research on KPA is focused on winemaking (Canuti et al, 2019; Eder et al, 2019; Bosso et al, 2020), toxicological and safety studies (Colombo et al, 2019; Dessipri, 2019)), and comparison to other available tartrate stabilization techniques (Gerbaud et al, 2010). The research was expanded to include other salts of polyaspartic acid, and polyaspartic acid, to provide more depth, with all related studies focusing on the positive attributes of biodegradability and non-toxicity, and its beneficial use in replacing more harmful products (Deng et al, 2019; Ji et al, 2021; Liu et al, 2023).

Our petition is supported by recent studies that focus on addressing the challenges in tartrate stabilization and advocating for more sustainable methods, as documented by research for the STABIWINE project (2015) Coulter et al (2015), Martinez-Perez et al. (2020), and Geveke & Runnebaum (2021). Further support comes from studies evaluating alternative methods with respect to their efficiency, compatibility, cost-effectiveness, and energy consumption (Canuti et al, 2019; Eder et al, 2019; Martinez-Perez et al, 2020; Puskas et al, 2021)

Regulatory and Safety information was established from the websites of the Food & Drug Administration (FDA), The Agricultural Marketing Service (AMS), The National Organic Standards Board (NOSB), the United States Environmental Protection Agency (USEPA), the Federal Register, The International Organization of Vine and Wine (OIV), the Alcohol and Tobacco, Tax and Trade Bureau (TTB), the Food and Agriculture Organization of the United

Nations (FAO), the Joint FAO/WHO Expert Committee on Food Additives (JEFCA), Food Standards of Australia and New Zealand (FSANZ) and the European Union (EU).

No research papers or evidence could be found to present a case for not including potassium polyaspartate as a synthetic on the National List.

Item B.13 Petition Justification Statement

E. Inclusion of a Synthetic on the National List (7 C.F.R. §§ 205.601, 205.603, 205.605(b))

Explain why the substance is necessary for use in organic handling.

Wine stability is one of the most important parameters to consider during winemaking, ensuring both product quality and consumer acceptance. While there are several options open to winemakers to achieve tartrate stability, they may not be suited to all wine types, have high environmental and economic costs, or be inefficient, time-consuming, and inaccessible to all producers.

Presently in the US, winemakers can use traditional cold stabilization, electrodialysis, potassium acid tartrate (in conjunction with cold stabilization), yeast mannoproteins, and gum Arabic to stabilize against tartrate precipitation in wines "made with organic grapes." While these present several options to winemakers – more are available to non-organic producers - each of these methods present advantages and disadvantages. These are discussed in the following section of the petition.

Potassium polyaspartate was developed as part of the European STABIWINE project to identify new biopolymers for protein and tartrate stabilization, which could reduce production costs, improve sustainability, and improve the quality of the finished wine. Of all the tartrate stabilization techniques available, the project concluded that KPA was the most efficient, with the lowest treatment cost, was the most environmentally friendly (lowest carbon and water footprint), and could be adopted by even the smallest wine producers (STABIWINE, 2015). Compared to the subtractive techniques, the additive options all provide significant environmental benefits, by reducing both energy and water consumption by up to 80%, as well as greenhouse gas emissions by up to 90%. Additionally, KPA was also shown to have the lowest environmental footprint among all the additives (STABIWINE, 2015).

Since then, research papers have continued to show that KPA is an efficient stabilizer that demonstrates advantages over other available techniques. Natolino et al. (2023) found that KPA addition allowed the preservation of aroma concentration in white wines, with no adverse effects. Another study comparing CMC and metatartaric acid to KPA determined that only KPA, even at half the recommended dose, was able to prevent precipitation of tartrates of the two grape varieties tested (Eder et al, 2019). Martinez-Perez et al. (2020) concluded KPA was the most preferred sensorially, while also providing good tartaric stability when compared to electrodialysis, ion exchange resins, and CMC.

In summary, KPA is synthesized from natural and renewable raw materials, is biocompatible and biodegradable, and non-toxic and allergenic, while also proving to be very efficient at preventing tartrate precipitation. Coupled with the significant environmental benefits, KPA would provide a cost-effective and sustainable option to organic wine producers in the US, whose choice is currently limited to methods that are either unsuited to all wine types, energy intensive, cost-prohibitive, or a combination of any of the three.

Describe nonsynthetic or synthetic substances on the National List or alternative cultural methods that could be used in place of the petitioned synthetic substance.

1. Subtraction methods

Cold Stabilization: The most traditional and commonly applied method of preventing tartrate instability, it involves cooling the wine to near freezing point for several days/weeks to induce precipitation of potassium bitartrate (KHT) prior to bottling. Potassium bitartrate (KHT) can be used as seeding crystals to reduce cold stabilization duration.

Despite being an effective method, results can vary based on different wineries interpretations of stability, the qualitative method used to determine wine stability, and the composition of the wine. Furthermore, the co-precipitation phenomenon associated with this method can lead to the loss of aroma compounds in white wine, and color and tannin in red, ultimately affecting wine quality.

Vernhet et al. demonstrated 0.2 – 0.3% loss in anthocyanins and a 1.9 – 2.5% loss of tannin in Carignan wines by analyzing tartrate composition following cold stabilization. Similarly to white wines, polysaccharides and polyphenols were also found in red wine tartrate precipitates, although in higher concentrations than those of the white wines tested (Vernhet et al., 1999a, Vernhet et al., 1999b). Several other studies also point to the loss of aromatics, mannoproteins, and other compounds associated with wine quality (Cabrita et al, 2016; Geveke & Runnebaum, 2020; Xia et al, 2022; Cui et al, 2024). A more recent study evaluating the effect of bottle storage on organic acids and aroma compounds in Riesling wine that had undergone cold stabilization found that after 12 months, aroma compounds had increased compared to the control (no cold stabilization), although a sensory evaluation found no significant improvements (Xia et al, 2022). Coupled with the loss of compounds associated with quality, other studies highlight potential wine losses of 1.45%, up to 3.5% from batch cold stabilization and noted the potential impact in quality of keeping wine refrigerated for a sustained period, due to the solubility of oxygen at lower temperatures and subsequent risk of oxidation (Southern California Edison, 2008; Geveke & Runnebaum, 2020). Cui et al (2024) also point to the environmental waste generated during the process, with crystals adhering to tank surfaces necessitating the use of harsh chemicals for cleaning procedures.

However, the biggest drawback associated with cold stabilization is the significant expenditure of energy used to keep the wine cold, with some estimating 50 – 70% of the winery's total electricity used during the process (Geveke & Runnebaum, 2020). It is for these reasons that the development of alternative methods of tartrate stability has gained interest amongst winemakers, looking to produce wines more sustainably.

Electrodialysis (ED): Permitted under CFR § 24.248 to aid in the removal of tartrates, the process must not alter the vinous character of the wine (ECFR, 2025).

Adopted from industrial uses for desalination of sea water, ED is a process in which ions are selectively separated from a solution using selectively permeable membranes. In winemaking, it is used for tartrate stabilization and has been shown to be an effective method to improve KHT stability (Cui et al, 2024), minimize wine losses, and reduce energy use (Southern California Edison, 2008; Cui et al, 2024), while having minimal impact on wine sensory characteristics, when compared to cold stabilization (AWRI Report, 2010: Geveke & Runnebaum, 2020). Another positive impact of ED is the removal of calcium ions, promoting calcium stability, and other metals which reduces the potential for oxidation in the wine (Martinez-Perez et al, 2020)

ED does, however, necessitate the use of more water than cold stabilization and the high-capital cost of the process eliminates smaller producers from using the technology (Geveke & Runnebaum, 2020). Fouling of the membranes is another problem associated with ED and the subsequent cleaning and replacement increases both environmental and economic costs in the process (Tsygurina et al, 2022).

Ion-Exchange Resins (IER): Ion exchange is a permitted process under CFR § 24.248 for various applications in wine and juice. The TTB lists references or limitations concerning the process (ECFR, 2025).

Ion exchange is used in various industries to purify water or isolate valuable products, and is also found in household applications, for example water softening where the exchange of calcium and magnesium ions for sodium and hydrogen ions converts hard water to soft water. In winemaking this process can be used to remove potassium and calcium ions from wine, by passing wine through a column of resinous beads coated with hydrogen ions. Potassium replaces the hydrogen ions on the beads and the hydrogen ions are transferred to the wine, thereby increasing acidity. Typically, only a small proportion of the wine is treated before being blended back.

Research on IER in winemaking is limited, but similar conclusions are drawn in the available articles. The benefits of the process include shorter processing times and lower energy use than cold stabilization, efficient tartrate stabilization, a lowering of pH and thus increase in acidity, and removal of metal catalyzers: the latter two promote microbial stability and oxidative stability respectively (Cabrita et al, 2016; Felipe Laurie et al, 2016; Runnebaum et al, 2022).

However, Cabrita et al. (2016) also describe the loss of phenolic compounds, namely anthocyanins and tannins, both important quality components in wine. A later study using wines from 2016 and 2017 found conflicting results in anthocyanin contents of red wines treated with IER for tartrate stability, with 2017 showing a much lower decrease in total anthocyanins. The authors conclude that, compared to other techniques investigated, IER showed the most changes in wine composition and was the least preferred sensorially (Martinez-Perez et al, 2020). Of the studies found, it appears that IER is the least favored treatment with respect to sensory characteristics, when compared to all other tartrate stabilization techniques. The equipment also requires a substantial investment, making it a less viable option for smaller producers.

2. Additive Methods

Metatartaric acid (MTA): Not permitted for use in winemaking in the USA.

Gum Arabic from *Acacia Seyal* (GA): Permitted under CFR § 205.606 (j) Nonorganically produced agricultural products allowed as ingredients in or on processed products labeled as "organic." Gums – water extracted only. Nonorganically produced agricultural products allowed as ingredients in or on processed products labeled as "organic."

Gum Arabic (E414) is the exudate of various species of Acacia trees, harvested mainly in Sudan. The gum is a predominantly made up of the polymers galactose and arabinose, is water soluble and is mainly used in the food industry as a stabilizer (CFR § 184.1330). The TTB permits its use for the clarification and stabilization of wine.

Gum Arabic from *Acacia Seyal* has been shown to provide some protection against tartrate precipitation in wines with a medium degree of instability (Bosso et al, 2010), although research since then has mainly focused on the alternative methods described in this petition, likely due to it being an inefficient tartrate stabilizer. Cui et al. (2024) advise against using gum Arabic in wines destined for long aging, or long-term storage, due to its stabilizing properties resulting in potential emulsification of precipitates. Its main use is as a complementary product to use in conjunction with other tartrate stabilization methods, and to enhance mouth feel and aromatics.

Sodium carboxymethylcellulose (CMC): A synthetically produced cellulose gum, CMC has been used in the food industry as an emulsifier since the 1940's and is used in multiple industries for many different purposes. In winemaking, CMC acts as a protective colloid, preventing precipitation of potassium tartrate crystals.

CMC is not listed under CFR § 205.605 as "a non-agricultural substance allowed in or on processed products labeled as "organic" or "made with organic (specified ingredients or food groups)."

Baker's Yeast Mannoproteins (MPs): It is well established that aging wine on the yeast lees produces a more stable, rounded wine than those that have had the lees removed. Based on this principle, commercially available MPs have been developed specifically for tartrate stabilization.

As a yeast derivative, mannoproteins would be permitted under CFR §205.605 (a)(30) as "a non-agricultural substance allowed in or on processed products labeled as "organic" or "made with organic (specified ingredients or food groups)."

MPs prevent crystal development by binding to nucleation points thereby slowing the rate of crystal growth. It is recommended to assess the wine prior to using MPs as differences in processing, age and colloidal structure can affect MP efficacy. In general MPs are efficient at preventing tartrate precipitation at a concentration of 200 mg/L, although Gerbaud et al (2010) note that higher doses may result in flocculation of mannoproteins, resulting in a less stable wine. The Australian Wine Research Institute (AWRI, 2025) states that mannoprotein-induced tartrate stability may decrease over time due to reactions with other wine components. Another drawback is the cost associated with MPs, which are by far the most expensive of the additive options and can be as expensive as cold stabilization with KHT seeding (Lasanta & Gomez, 2012).

Potassium acid tartrate: Permitted under CFR § 205.606 (p) Nonorganically produced agricultural products allowed as ingredients in or on processed products labeled as "organic." Used as a seeding crystals to initiate tartrate nuclei formation and reduce cold stabilization duration.

Describe any beneficial effects on the environment, or human health from the use of the substance that support its use instead of the use of non-synthetic or synthetic substances on the National List or alternative cultural methods.

Environmental Impact

KPA is synthesized from natural and renewable raw materials, is biodegradable, non-toxic, and does not persist in the environment, reducing the ecological footprint associated with its use.

The impact of choosing KPA over traditional cold stabilization contributes significantly to reducing the environmental footprint of an important winemaking stabilization process. Table 1. provides a summary of the greenhouse gas emissions in kilograms of carbon dioxide equivalents per hectoliter of wine for all tartrate stabilization methods available at the time the STABIWINE report was published.

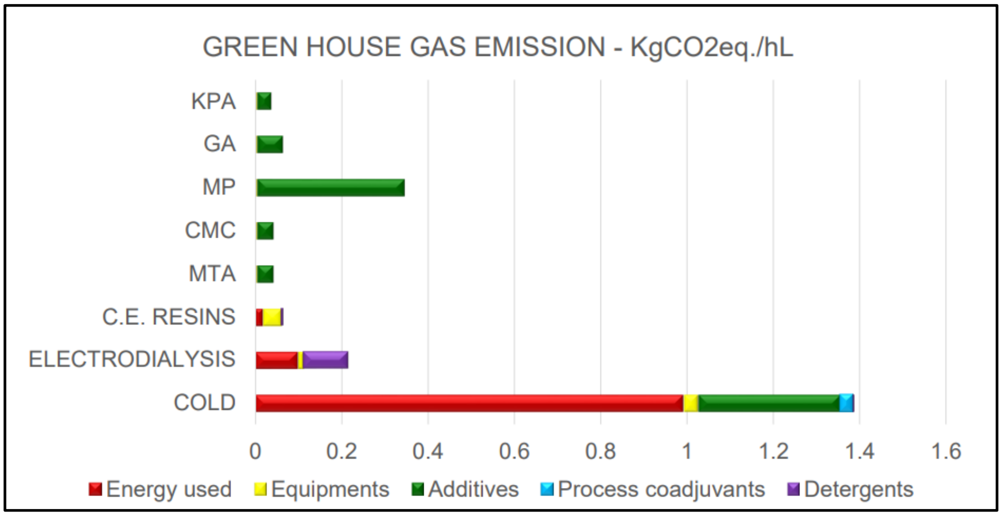

Table 1. Comparison of carbon dioxide emissions for most available tartrate stabilization techniques (STABIWINE, 2015)

Cold stabilization, while generally respectful of the wine, is time-consuming, energy and labor intensive, and not always reliable, hence the proliferation of alternative methods available to wine producers.

Human Health

KPA is non-toxic and non-allergenic, and has been the subject of numerous safety assessments, culminating in its addition to the Codex Alimentarius in 2024.

While there are no direct beneficial effects on human health from using KPA, neither are there any from other additive methods available to winemakers on the National List. By giving wine producers the option to use KPA, it could indirectly benefit human health by reducing the environmental impact of energy-intensive subtractive methods.

Contribution to Sustainable Practices

Research has highlighted KPA's role in promoting sustainable agricultural practices, including its ability to bind and remove heavy metals and toxins from soils and water, thereby playing a crucial role in environmental remediation. These practices also contribute indirectly to human health.

The impact of choosing KPA over traditional cold stabilization contributes significantly to reducing the environmental footprint of wine production.

Regulatory and Safety Compliance

The U.S. Environmental Protection Agency (EPA) has exempted KPA from tolerance limits due to its low toxicity, underscoring its safety and environmental benefits. This exemption indicates a recognition of KPA's benign nature and supports its inclusion as a preferred substance in organic agriculture and winemaking.

The evidence clearly supports the use of KPA not only as a technically effective alternative but also as a means to enhance environmental and human health outcomes compared to more traditional methods. This makes it a valuable addition to the tools available for organic winemakers looking to produce high-quality, sustainable, safe products in a healthy environment.

Item B.14 References

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Appendix

Appendix A

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STABILISATION TARTRIQUE

Composition
E456 Polyaspartate de potassium
E220 Anhydride sulfureux
approx. 0.4%
Eau déminéralisée qsp 100%
Applications
Stabilisation tartrique des vins.
Dose d'emploi
Dosage jusqu'à 100 mL/hL (dose max. légale dans l'UE)
Mode d'emploi
Ajouter au vin de façon homogène. À utiliser dans un vin limpide prêt à la mise en bouteille, avec une couleur stable et sans instabilité protéique. Consulter la fiche technique avant utilisation.
Conservation
Récipient fermé: conserver dans un endroit frais, sec et ventilé, à l'abri de la lumière. Récipient ouvert: referme soigneusement et conserve dans les conditions décrites ici dessus.

ESTABILIZAÇÃO TARTÁRICA

Composição
E456 Poliaspartato de potássio
E220 Anidrido sulfuroso
approx. 0.4%
Água desmineralizada até completar os 100%
Aplicações
Estabilização tartárica dos vinhos.
Doses
Até um máximo de 100 mL/hL (dose máx. legal na UE)
Instruções de utilização
Aplicar ao vinho, de forma homogénea. Utilizar em vinho perfeitamente límpido, estável do ponto de vista corante e proteico, pronto a ser engarrafado. Consultar previamente a ficha técnica.
Conservação
Embalagem fechada: conservar num local fresco, seco, ventilado e ao abrigo da luz. Embalagem aberta: fechar bem e conservar como acima indicado.

WEINSTEINSTABILISIERUNG

Zusammensetzung
E456 Kaliumpolyaspartat
E220 Schwefeldioxid ca. 0.4%
Demineralisiertes Wasser auf 100%
Verwendung
Weinsteinstabilisierung von Weinen.
Dosierung
Bis zu 100 mL/hL (maximale Dosierung laut EU-Gesetz)
Gebrauchsanweisung
Homogen dem Wein zusetzen. Einsatz nur im blanken, eiweiß- und farbstabilem, füllfertigem Wein. Vor Gebrauch das entsprechende technische Datenblatt anschauen.
Lagerung
Ungeöffnete Verpackung: in kühlem, trocknem und gut belüftetem Raum lagern. Offene Verpackung: sorgfältig verschließen und wie ungeöffnete Verpackung lagern.

POUR USAGE ŒNOLOGIQUE - EXCLUSIVEMENT À USAGE PROFESSIONNEL
POUR DENRÉES ALIMENTAIRES NE PAS ABANDONER L'EMBALLAGE DANS LA NATURE
PARA USO ENOLÓGICO - EXCLUSIVAMENTE PARA USO PROFISSIONAL - PARA ALIMENTOS
NÃO ELIMINAR A EMBALAGEM NO MEIO AMBIENTE
FÜR DEN ÖNOLOGISCHEN GEBRAUCH - NUR ZUR FACHGERECHTEN ANWENDUNG - FÜR LEBENSMITTEL
BITTE, ENTSORGEN SIE DIE VERPACKUNG AUF KORREKTE ART UND WEISE

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STABILIZZAZIONE TARTARICA

Composizione
E456 Poliaspartato di potassio
E220 Anidride solforosa circa 0.4%
Acqua demineralizzata complemento a 100%
Applicazioni
Stabilizzazione tartarica dei vini.
Dosi
Fino a 100 mL/hL (dose max. legale nella UE)
Modalità d'uso
Aggiungere al vino da trattare in modo omogeneo. Utilizzare in vino perfettamente limpido, privo di colore e proteine instabili, pronto per l'imbottigliamento. Consultare la scheda tecnica prima dell'uso.
Conservazione
Confezione chiusa: conservare al riparo da sole, in luogo asciutto, fresco e ventilato. Confezione aperta: richiudere accuratamente e conservare come sopra.

TARTRATE STABILIZATION

Composition
E456 Potassium polyaspartate,
E220 Sulphur dioxide
approx. 0.4%
Demineralized water to 100%
CONTAINS: Sulphites
Applications
Tartrate stabilization of wine.
Dosage
Up to 100 mL/hL (maximum legal dose in the EU)
Instructions for use
Add to the wine homogenously. Use in wine that is already clarified, and ready for bottling. Consult the corresponding technical data sheet before use.
Storage
Sealed package: store away from light in a cool, dry, well-ventilated area. Open package: carefully reseal and store as indicated above.

ESTABILIZACIÓN TARTÁRICA

Composición
E456 Poliaspartato de potasio
E220 Anhídrido sulfuroso
cerca de 0.4%
Agua desmineralizada hasta el 100%
Aplicaciones
Estabilización tartárica de los vinos.
Dosis
Hasta 100 mL/100 L (dosis máx. legal en la UE)
Modo de empleo
Añadir al vino en modo homogeneo. Aplicar en vino perfectamente limpio, preparado para su embotellado. Antes de utilizar, consultar la ficha técnica.
Conservación
Confección cerrada: conservar al abrigo del sol, en lugar fresco, seco y ventilado. Confección abierta: cerrar con cuidado y conservar como indicado arriba.

PER USO ENOLOGICO - ESCLUSIVAMENTE PER USO PROFESSIONALE - PER ALIMENTI
NON ABBANDONARE IL CONTENITORE NELL'AMBIENTE
FOR ENOLOGICAL USE - FOR PROFESSIONAL USE ONLY - FOR FOOD
PLEASE DISCARD THE CONTAINER PROPERLY
PARA USO ENOLÓGICO - EXCLUSIVAMENTE PARA USO PROFESIONAL
DESTINADO A LA ALIMENTACIÓN
NO ABANDONAR EL ENVASE EN EL MEDIO AMBIENTE DESPUÉS DEL USO
NO DESTINADO A LA VENTA AL CONSUMIDOR FINAL

20 kg

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Appendix B – Zenith UNO Safety Data Sheet (SDS-US-EN-ZenithUno.pdf)

Safety Data Sheet
Zenith Uno
Safety Data Sheet dated: 3/3/2022 - version 2

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1. IDENTIFICATION
Product identifier
Mixture identification:
Trade name: Zenith Uno
Other means of identification:
Product Code: 35-792-0005, 35-792-0020, 35-792-1000.
Recommended use of the chemical and restrictions on use
Recommended use: FOR PROFESSIONAL USE
FOR ENOLOGICAL USE
Restrictions on use: N.A.
Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party
Company:
ESSECO S.r.l. Via San Cassiano 99
28069 - Trecate (NO)
Italy
Importer in USA:
Enartis USA Inc.
7795 Bell Road
Windsor
CA 95492
Competent person responsible for the safety data sheet: vino@enartis.it
Emergency telephone number
Phone: +1 (707) 838 6312
Fax: +1 (707) 838 1765

2. HAZARD(S) IDENTIFICATION
Classification of the chemical
The product is not classified as dangerous according to OSHA Hazard Communication Standard (29 CFR 1910.1200).

Label elements
The product is not classified as dangerous according to OSHA Hazard Communication Standard (29 CFR 1910.1200).
Hazards not otherwise classified identified during the classification process:
None

3. COMPOSITION/INFORMATION ON INGREDIENTS
Substances
N.A.
Mixtures
Hazardous components within the meaning of 29 CFR 1910.1200 and related classification:
None

4. FIRST AID MEASURES
Description of first aid measures
In case of skin contact:
Wash with plenty of water and soap.
Seek medical attention if skin irritation, swelling or redness develops and persists.
In case of eyes contact:
Wash immediately with water.
In case of Ingestion:
Induce vomiting. SEEK A MEDICAL EXAMINATION IMMEDIATELY and present the safety-data sheet.
In case of Inhalation:
Remove casualty to fresh air and keep warm and at rest.

Most important symptoms/effects, acute and delayed
N.A.
Indication of any immediate medical attention and special treatment needed
N.A.

5. FIRE-FIGHTING MEASURES

Extinguishing media
Suitable extinguishing media:
Water.
Carbon dioxide (CO_2).
Unsuitable extinguishing media:
None in particular.
Specific hazards arising from the chemical
Do not inhale explosion and combustion gases.
Hazardous combustion products: N.A.
Explosive properties: N.A.
Oxidizing properties: N.A.
Special protective equipment and precautions for fire-fighters
Use suitable breathing apparatus .
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Move undamaged containers from immediate hazard area if it can be done safely.
Wear suitable protective clothing (helmet, protective clothings, goggles, fire resistant gloves, boots) and protect respiratory organs (self contained breathing apparatus).
Fire residues and contaminated firefighting water must be disposed of in accordance within the local regulations.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Wear personal protection equipment.
Remove persons to safety.
See protective measures under point 7 and 8.
Methods and material for containment and cleaning up
Wash with plenty of water.
Suitable material for taking up: absorbing material, organic, sand
Dispose of the collected material in accordance with the current regulations.

7. HANDLING AND STORAGE

Precautions for safe handling
Do not eat or drink while working.
See also section 8 for recommended protective equipment.
Conditions for safe storage, including any incompatibilities
Keep away from open flames, sparks and heat sources.
Incompatible materials:
None in particular.
Instructions as regards storage premises:
Adequately ventilated premises.
Storage temperature: N.A.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
No data available
Appropriate engineering controls: N.A.
Individual protection measures
Please see both sections 5 and 6 for information about personal protective equipment to be worn in an emergency (e.g.: fire or unintentional release of the substance).
Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
The final choice of protective equipment will depend upon a risk assessment.
Personal protective equipment selections vary based on potential exposure conditions and working conditions.
Eye protection:

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Not needed for normal use. Anyway, operate according good working practices.

Protection for skin:

No special precaution must be adopted for normal use.

Protection for hands:

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Not needed for normal use.

Glove suitability and breakthrough time will differ depending on the specific use conditions.

Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions.

Respiratory protection:

Depending on the potential for exposure, select respiratory protective equipment suitable for the specific conditions of use and in compliance with current legislation.

N.A.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State: Liquid
Appearance and colour: Liquid
Odour: Characteristic
Odour threshold: N.A.
pH: ± 3.65
Melting point / freezing point:
Initial boiling point and boiling range: N.A.
Flash point: N.A.
Evaporation rate: N.A.
Upper/lower flammability or explosive limits: N.A.
Vapour density: N.A.
Vapour pressure: N.A.
Relative density: 1.1 g/cm3
Solubility in water: 100%
Solubility in oil: N.A.
Partition coefficient (n-octanol/water): N.A.
Auto-ignition temperature: N.A.
Decomposition temperature: N.A.
Viscosity: N.A.
Explosive properties: N.A.
Oxidizing properties: N.A.
Solid/gas flammability: N.A.

Other information

Substance Groups relevant properties N.A.
Miscibility: N.A.
Fat Solubility: N.A.
Conductivity: N.A.

10. STABILITY AND REACTIVITY

Reactivity

Stable under normal conditions

Chemical stability

Data not available.

Possibility of hazardous reactions

None in particular.

Conditions to avoid

Stable under normal conditions.

Incompatible materials

None in particular.

Hazardous decomposition products

None

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Toxicological Information of the Preparation

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a) acute toxicity	Not classified Based on available data, the classification criteria are not met
b) skin corrosion/irritation	Not classified Based on available data, the classification criteria are not met
c) serious eye damage/irritation	Not classified Based on available data, the classification criteria are not met
d) respiratory or skin sensitisation	Not classified Based on available data, the classification criteria are not met
e) germ cell mutagenicity	Not classified Based on available data, the classification criteria are not met
f) carcinogenicity	Not classified Based on available data, the classification criteria are not met
g) reproductive toxicity	Not classified Based on available data, the classification criteria are not met
h) STOT-single exposure	Not classified Based on available data, the classification criteria are not met
i) STOT-repeated exposure	Not classified Based on available data, the classification criteria are not met
j) aspiration hazard	Not classified Based on available data, the classification criteria are not met

Substance(s) listed on the IARC Monographs:

None

Substance(s) listed as OSHA Carcinogen(s):

None

Substance(s) listed as NIOSH Carcinogen(s):

None

Substance(s) listed on the NTP report on Carcinogens:

None

12. ECOLOGICAL INFORMATION

Toxicity

Adopt good working practices, so that the product is not released into the environment.

Eco-Toxicological Information:

List of Eco-Toxicological properties of the product

Not classified for environmental hazards.

No data available for the product

Persistence and degradability

N.A.

Bioaccumulative potential

N.A.

Mobility in soil

N.A.

None

Other adverse effects

N.A.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Recover if possible. In so doing, comply with the local and national regulations currently in force.

14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

UN number

ADR-UN number: N.A.
DOT-UN Number: N.A.
IATA-Un number: N.A.
IMDG-Un number: N.A.

UN proper shipping name

ADR-Shipping Name: N.A.
DOT Proper Shipping Name: N.A.
IATA-Technical name: N.A.
IMDG-Technical name: N.A.

Transport hazard class(es)

ADR-Class: N.A.
DOT Hazard Class: N.A.
IATA-Class: N.A.
IMDG-Class: N.A.

Packing group

ADR-Packing Group: N.A.
ADR exempt: N.A.
IATA-Packing group: N.A.
IMDG-Packing group: N.A.

Environmental hazards

Marine pollutant: No
Environmental Pollutant: N.A.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

N.A.

Special precautions

Department of Transportation (DOT):
N.A.
Road and Rail (ADR-RID):
N.A.
Air (IATA):
N.A.
Sea (IMDG):
N.A.

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15. REGULATORY INFORMATION

Listed on Canadian DSL, Australian AICS, Phillipines PICCS, Chinese IECSC, Japanese MITI, Korean KECL, and EU EINECS.

USA - Federal regulations

TSCA - Toxic Substances Control Act

TSCA inventory:

All the components are listed on the TSCA inventory

TSCA listed substances:

No substances listed

SARA - Superfund Amendments and Reauthorization Act

Section 302 - Extremely Hazardous Substances:

No substances listed

Section 304 - Hazardous substances:

No substances listed

Section 313 - Toxic chemical list:

No substances listed

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

Substance(s) listed under CERCLA:

No substances listed

CAA - Clean Air Act

CAA listed substances:

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No substances listed

CWA - Clean Water Act

CWA listed substances:

No substances listed

USA - State specific regulations

California Proposition 65

Substance(s) listed under California Proposition 65:

No substances listed

Massachusetts Right to know

Substance(s) listed under Massachusetts Right to know:

No substances listed

Pennsylvania Right to know

Substance(s) listed under Pennsylvania Right to know:

No substances listed

New Jersey Right to know

Substance(s) listed under New Jersey Right to know:

No substances listed

16. OTHER INFORMATION

Safety Data Sheet dated: 3/3/2022 - version 2

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality. The information relates only to the specific material and may not be valid for such material used in combination with any other material or in any process.

This document was prepared by a competent person who has received appropriate training.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This MSDS cancels and replaces any preceding release.

Legend to abbreviations and acronyms used in the safety data sheet:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
RID: Regulation Concerning the International Transport of Dangerous Goods by Rail.
IMDG: International Maritime Code for Dangerous Goods.
IATA: International Air Transport Association.
IATA-DGR: Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
ICAO: International Civil Aviation Organization.
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO).
GHS: Globally Harmonized System of Classification and Labeling of Chemicals.
CLP: Classification, Labeling, Packaging.
EINECS: European Inventory of Existing Commercial Chemical Substances.
INCI: International Nomenclature of Cosmetic Ingredients.
CAS: Chemical Abstracts Service (division of the American Chemical Society).
GefStoffVO: Ordinance on Hazardous Substances, Germany.
LC50: Lethal concentration, for 50 percent of test population.
LD50: Lethal dose, for 50 percent of test population.
DNEL: Derived No Effect Level.
PNEC: Predicted No Effect Concentration.
TLV: Threshold Limiting Value.
TWATLV: Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).
STEL: Short Term Exposure limit.
STOT: Specific Target Organ Toxicity.
WGK: German Water Hazard Class.
KSt: Explosion coefficient.
Not Available

The information in this SDS is provided all the relevant data fully and truly. However, the information is provided without any warranty on their absolute extensiveness and accuracy. This SDS was prepared to provide safety preventive measures for the users who have got professional training. The personal user who obtained this SDS should make independent judgment for the applicability of this SDS under special conditions. In these special cases, we do not assume responsibility for the damage.

Paragraphs modified from the previous revision:

- Safety Data Sheet

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- 2. HAZARDS IDENTIFICATION
- 3. COMPOSITION/INFORMATION ON INGREDIENTS
- 4. FIRST AID MEASURES
- 5. FIRE-FIGHTING MEASURES
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