

ნოვოფერტი-ჯორჯია



Novofert-Georgia

**Limited Liability Company “Novofert- Georgia”**

Identification number 416318069

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## **PASSPORT of Chemical Products**

- 1. Fertilizers N-P-K (12-6-28) + 7,5CaO water-soluble with microelements (mark Novofert)**
- 2. Fertilizers N-P-K (19-19-19) + 1MgO water-soluble with microelements (mark Novofert)**
- 3. Fertilizers N-P-K (2,5-40-25) + 2MgO water-soluble with microelements (mark Novofert)**
- 4. Fertilizers N-P-K (3,5-17-30) + 4MgO water-soluble with microelemets (mark Novofert)**
- 5. Fertilizers N-P-K (6-20-30) + 1MgO water-soluble with microelements (mark Novofert)**
- 6. Fertilizers N-P-K (15,2-0-1) + 29,5CaO water-soluble with microelements (mark Novofert)**
- 7. Fertilizers N-P-K (18-18-18) + 3MgO water-soluble with microelements (mark Novofert)**

**Section 1. Identification of the chemical product and of the company.****Chemical products name:**

- 1. Fertilizers N-P-K (12-6-28) + 7,5CaO water-soluble with microelements (mark Novofert) –**  
N-12%, P<sub>2</sub>O<sub>5</sub>-6%, K<sub>2</sub>O-28%+7,5CaO+0,9B+0,07Fe+0,04Mn+0,02Zn+0,015Cu+0,005Mo.
- 2. Fertilizers N-P-K (19-19-19) + 1MgO water-soluble with microelements (mark Novofert) -**  
N-19%, P<sub>2</sub>O<sub>5</sub>-19%, K<sub>2</sub>O-19% + 1MgO + 0,1B + 1S+0,2Fe+0,2Mn+0,2Zn+0,1Cu+0,002Mo.
- 3. Fertilizers N-P-K (2,5-40-25) + 2MgO water-soluble with microelements (mark Novofert) –**  
N-2,5%, P<sub>2</sub>O<sub>5</sub>-40%, K<sub>2</sub>O-25%+2MgO+2B+2S.
- 4. Fertilizers N-P-K (3,5-17-30) + 4MgO water-soluble with microelemets (mark Novofert)-**  
N-3,5%, P<sub>2</sub>O<sub>5</sub>-17%, K<sub>2</sub>O-30%+4MgO+0,9B+14S+0,05Fe+0,03Mn+0,02Zn+0,015Cu+0,005Mo.
- 5. Fertilizers N-P-K (6-20-30) + 1MgO water-soluble with microelements (mark Novofert) –**  
N-6%, P<sub>2</sub>O<sub>5</sub>-20%, K<sub>2</sub>O-30% + 1MgO + 0,1B + 11S+0,2Fe+0,2Mn+0,2Zn+0,1Cu+0,002Mo.
- 6. Fertilizers N-P-K (15,2-0-1) + 29,5CaO water-soluble with microelements (mark Novofert) –**  
N-15,2%, P<sub>2</sub>O<sub>5</sub>-0%, K<sub>2</sub>O-1%+29,5CaO+1B.
- 7. Fertilizers N-P-K (18-18-18) + 3MgO water-soluble with microelements (mark Novofert) –**  
N-18%, P<sub>2</sub>O<sub>5</sub>-18%, K<sub>2</sub>O-18%+3MgO+0,09B+3S+0,05Fe+0,04Mn+0,02Zn+0,02Cu+0,005Mo

The products are intended for agriculture and retailing as a mineral nitrogen-phosphorus-potassium fertilizers. The product is used for all types of soil for the next crop: cereals (wheat, barley, canola, corn), potatoes, beets, sunflowers and others. Fertilization methods are foliar application or drip irrigation. Application is valid only intended to feed plants.

**LLC "Novofert" is the manufacturer of these fertilizers.**

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## **Section 2. Hazards Identification.**

Fertilizers N-P-K water-soluble with microelements (mark Novofert) are a mixture of fire safety and explosion safety components. It is necessary to avoid contact with combustible substances and acids.

Flash point: not burn.

Ignition temperature: not burn.

Auto-ignition temperature: not burn.

Hazard class in terms of impact on the human body: III, is considered moderately dangerous under GOST12.1.007. The components that make up the fertilizer has overall toxic effects on the human body, irritate the eyes, upper respiratory tract, skin.

In areas where fertilizer store is not permitted to food store and consumption.

A person 18 years of age allowed to independently work for the production, storage, transport and use of fertilizers.

The packages (bags, containers, etc.) must be marked "Keep away from moisture" and "Protect from sunlight."

### Section 3. Composition (Information on ingredients).

**For the production of fertilizers used the following components:**

#### a) Rectified Monoammonium phosphate

Chemical name: ammonium phosphate monobasic.

Molecular formula:  $\text{H}_6\text{NO}_4\text{P}$ .

Structural formula:  $(\text{NH}_4)\text{H}_2\text{PO}_4$ .

Synonyms: ammonium dihydrogen phosphate, ammonium phosphate, phosphoric acid, monoammonium salt of phosphoric acid.

Registration numbers: CAS7722-76-1, EINECS 231-764-5, Russian Register POHBV №VT000371 from 03.15.95.

Impurities: fluorides, lead, cadmium, copper, manganese, zinc, nickel, water.

Product: powder, granules.

Odour: Slight ammonia.

Volatility: Non-volatile.

Reactivity: reacts with acids, alkalis, decomposes during storage and heating.

Risk of ignition and burning: does not burn.

Toxicity:  $\text{DL}_{50} = 5750 \text{ mg / kg}$  (rat, p.o.)

The clinical picture of acute poisoning: weakness, lethargy, headache, disturbance of the respiratory rhythm.

Irritant effect: on the skin, eyes, respiratory tract.

Atmospheric air: hazard class IV.

For MAP:  $\text{PDK}_{\text{av}} = 2 / 0.2 \text{ mg / m}^3$  (res.).

Water:  $\text{PDK}_{\text{rh}} = 0.5 \text{ mg / l}$  (as  $\text{NH}_4$ ).

Workplace air: for MAP  $\text{PDK}_{\text{rz}} = 6 \text{ mg / m}^3$ .

Special precautions during transportation, handling and storage: Store in a covered, dry, warehouses equipped with aeration exhaust ventilation. Containers must be kept tightly closed. Transport marking according to GOST 14192-77 with the application of the manipulation sign "Keep away from moisture", Hazard Class 9, subclass 9.1.

Goggles, rubber gloves knitted.

#### b) Potassium nitrate

Chemical name: Potassium nitrate.

Molecular Formula:  $\text{KNO}_3$ .

The structural formula is:  $\text{KO-NO}_2$ .

Synonyms: potassium nitrate, potassium nitrate, nitric acid, potassium salt.

Registration numbers: CAS7757-79-1, RTECSTT3700000, Russian Register POHBV №AT000497 from 05/30/95, the UN №1486.OKP214311.

Application: chemical, food industry, agriculture, production of matches, gunpowder.

The degree of purity (product): 99,85-99,90%.

Physico-chemical properties:

Physical state - solid.

Melting point -  $334^\circ \text{C}$ .

Boiling point: not achieved decomposes at  $t = 400\text{ }^{\circ}\text{C}$

Solubility in water: 13.3 g / 100 ml at  $0\text{ }^{\circ}\text{C}$ , 35g / 100 ml at  $20\text{ }^{\circ}\text{C}$ .

Smell - no.

Volatility - not volatile.

Miscibility: A substance - water  $20\text{ }^{\circ}\text{C}$  - is mixed with hot water.

Conditions of storage and use.

Special precautions during transportation, handling and storage: Store in an airtight container in a dry place. Avoid mixing with combustibles and organic substances. Prohibited dilution of fire and smoke in the storage area of the product.

Incompatibility with substances: organic substances, acids, alkalis.

Hazardous decomposition products: the thermal degradation - potassium nitrate, potassium oxide, oxides of nitrogen, oxygen.

Personal protective equipment: respirators, goggles, protective clothing.

Recycling: burial, deactivation.

Risk of ignition and combustion: the substance does not burn, but promotes self-ignition of combustible materials.

Flash point - does not burn.

The ignition temperature is off.

Extinguishing Media: stew with plenty of water, dry sand, asbestos blanket nitrogen.

Apply extinguishers OP-3 OP-5, 10-OHP.

Toxicity:

Acute toxicity - DL50 = 3750 mg / kg (rat), DL50 = 1901 mg / kg (rabbits), DLmin = 100 mg / kg (kjrjb).

Cumulatively: weak.

The clinical picture of acute poisoning: Inhalation - weakness, headache, sore throat, cough; in swallowing - nausea, vomiting, abdominal pain. In severe cases, - shortness of breath, cyanosis of the skin and mucous membranes, rapid heartbeat, low blood pressure, seizures.

The most injured organs and systems: the nervous respiratory and cardio - vascular system, gastro - intestinal tract, liver, kidneys, spleen, blood.

Dose (concentration), have minimal toxic effects:

ED = 105 mg / l (NO<sub>3</sub>) - rat PDhr = 5.9 mg / kg (rat).

Irritability: skin, eyes, respiratory tract.

Workplace air: PDKrz = 5 mg / m<sup>3</sup>.

Water VOHPKKV: for nitrates MPCw = 45.0 mg / l.

Skin: The standard is not installed.

Food: DUpischa for nitrates (nitrate)  $\leq 200$  mg / kg (canned meat, oil), 80 mg / kg (onion), 400 mg / kg (carrots, peppers, zucchini), 50 mg / kg (fruit and vegetable) 600 mg / kg (beet).

Soil: for nitrates MPCs = 130 mg / kg (vodomigratsionny).

Hazard Class:

Atmosfery air: not set.

Workplace air: hazard class III.

Water: Water is not installed, Nitrate Hazard Class III.

First aid measures.

First aid for poisoning:

General measures: rest, warm, comfortable position, access to clean air.

Inhalation: give humidified oxygen or carbogen.

Ingestion: Clean mouth from the remnants of the product. Rinse with water. Drink raw milk, eggs, vegetable oil.

Eye contact: Rinse the cavity of the conjunctiva with warm running water at a wide-open eye socket, make lotions with cold water, tea.

Skin contact: Remove and remove contaminated clothing, shoes and equipment. Wash the affected areas with water. Lubricate the neutral fat.

Environmental security

Stability conditions of abiotic (): 30-7 days.

Transformation in the environment - yes.

Transformation products - no information available.

Acute toxicity to fish - CL100 > 1200 mg / l (24 hours).

The toxic effect on algae (culture) ECN > 237 mg / liter.

Toxic effect on subsoil vertebrates - no information available.

### c) Calcium nitrate

Chemical name: calcium nitrate.

Molecular Formula: Ca (NO<sub>3</sub>)<sub>2</sub>.

Melting point: 5610S.

Hazard identification: Labelling according to EC Directives: №2003 / 2003 of the European Parliament and of the Council of 13.10.2013 applied fertilizer - is not considered dangerous.

Composition (Information on Ingredients): 26.5% CaO and 15,5% N (nitrogen).

First aid measures: slightly hazardous if swallowed, in contact with the eyes - rinse with water. Seek medical advice.

Fire-fighting measures: The product is not flammable.

Handling and Storage:

Treatment - Avoid dust formation.

Storage - No specific recommendations. Keep container tightly closed and dry.

Exposure controls / personal protection:

Personal protection - protective clothing, depending on the concentration and quantity of hazardous substances handled. Compliance with these conditions overalls work must be confirmed by the supplier.

Respiratory protection - is needed in the formation of aerosols.

Eye protection - is needed.

Hand protection - gloves. Protective gloves have to satisfy the specifications of EU Directive 89/686 / EEC.

Industrial hygiene - Change contaminated clothing. It is recommended to use a barrier cream. Wash hands after working with substance.

Physical and chemical properties:

Form: pellets 1-5mm.

White color.

Stability and reactivity: Stable product.

Toxicological information:

- After eye contact - slight irritation;
- After inhalation of dust - symptoms of irritation of the respiratory tract;
- After ingestion - nausea, vomiting;
- Systemic effects - methemoglobinemia after the uptake of large quantities.

Additional Information: gentle product handling.

Environmental information: is not easy to biodegradation.

Waste Disposal: Chemicals must be disposed of in accordance with national regulations.

Transportation:

Auto / railway. Transportation: international rules of rail / auto transport particularly dangerous goods (ADR / RID): not the subject of transport legislation - safe.

Maritime transport: Inter-Governmental Maritime Consultative Organization / International Maritime Dangerous Goods Code (IMCO / IMDG): safe.

The following applies to nitrates in general: may cause eutrophication. Dangerous for drinking water.

Packing: destroyed in accordance with specific rules set out in the country or sent for recycling.

## d) Potassium sulphate

Chemical name: Potassium sulfate. Potassium sulphate.

Chemical formula:  $K_2O_4S$ ;  $K_2(SO_4)$ ;  $H_2O_4S \cdot 2K$ ;  $O_4-S \cdot 2K$ .

Molecular weight: 174.27 amu.

Structural formula:  $[K^-] [-O-(O=)S(=O)-O^-] [+K]$

Synonyms: Arcana; Potassium sulphate; Potassium sulfate; Arcanum duplicatum etc.

Trade name: Potassium sulfate; Potassium sulphate.

Regulatory documentation: Can comply with GOST 145-74 4; TU-2184 GPC-43499406-98. TU U 6-00209119.002-96.

Registration numbers: CAS 7778-80-5. Another CAS: 10233-01-9. RTECS TT5900000. E1NECS 231-915-5. Russian Register POHBV number of LT000797 20.12.95g.

Application: chemical, metallurgy, textile industry, agriculture,

The degree of purity (product):  $\geq 95\%$ ;  $\geq 50\%$  (in terms of PA  $K_2O$ ).

Impurities: chlorides, sulfates, water: potassium hydrogen sulfate, potassium chloride, magnesium sulfate, magnesium chloride, sodium sulfate, sodium chloride, calcium sulfate, calcium chloride, aluminum sulfate, aluminum chloride.

Physico-chemical properties:

Appearance: solid (orthorhombic crystals).

Boiling point:  $1689^\circ C$ ; other data:  $\sim 2000^\circ C$ .

Melting point:  $1069^\circ C$ ; other data  $1074^\circ C$ .

Density:  $2.66 \text{ g/cm}^3$  (at a temperature of  $> 584^\circ C$  - resistant hexagonal modification with a density of  $2.26 \text{ g/cm}^3$ ).

Solubility in water:  $7.35 \text{ g/100 g}$  ( $0^\circ C$ );  $11.1 \text{ g/100 g}$  ( $20^\circ C$ );  $14.8 \text{ g/100 g}$  ( $40^\circ C$ );  $24.2 \text{ g/100 g}$  ( $100^\circ C$ ).

Fat solubility: not soluble.

Solubility in other solvents not soluble in ethanol, acetone  $CS_2$ . Not soluble in organic solvents.

Solubility increases in highly polar solvents. Practically insoluble in saturated ammonium sulfate solution. Dissolved in glycerol ( $1 \text{ g/ml}$  '75).

Miscibility (substance-water,  $20^\circ C$ ) is not mixed.

Hydrogen index: pH - 7 (aqueous substance is neutral), pH = 5-7.5 (11%. 0.63 M); 7.9 (10%. 0,57M) (calc. Value at  $20^\circ C$ ). pH = 5.5-8.5 (at a concentration of 50 g / liter of water).

Smell: none.

Volatility: non-volatile.

Vapor pressure: does not form a pair of standard conditions.

Reactivity: very weak inorganic base. Reacted with acids, alkalis, forms double salts, including Alum.

Product form: colorless or white crystals, granules, powder.

Storage and handling:

Special precautions during transportation, handling and storage: Store in a dry warehouses equipped with a mechanical supply and exhaust ventilation, and in the field of education and scattering dust - local mechanical suction devices, tightly closed, away from incompatible materials.

Incompatibility with substances: strong acids and bases, strong oxidants, aluminum, magnesium, sodium, calcium.

Hazardous decomposition products: at temperatures  $> 2000^\circ C$  - oxides of sulfur, oxides of potassium.

Personal protection: respirators. Safety goggles. Protective gloves. Protective clothing.

Interventions for spills: Absorb into dry process inscribed sealable container. Contaminated surface wash with 2-5% solution of soda ash.

Disposal (neutralization): Return to the production cycle. Burial.

Risk of ignition and combustion:

Flash Point: Off. Ignition temperature: Off.

Auto-ignition temperature: Off.

Temperature limits of flame propagation: Not applicable.

Flammability limits: Not applicable.

Ability Chemicals: At temperatures > 2000 ° C with the formation of sulfur oxides, potassium oxides.

Extinguishing Media: selected depending on fire and explosive properties of combustible materials in the zone of fire with this product.

Special fire safety measures: Not required.

Toxicity

Acute toxicity:

DL50 = 6600 mg / kg (rat, w / w).

DL50 = 6600 mg / kg (mouse, w / w).

DL50 = 6600 mg / kg (guinea pig, w / w).

DL50 = 1250 mg / kg (mouse, a / b).

DL50 = 1250 mg / kg (rat, a / b).

DL50 = 1250 mg / kg (guinea pig, a / b).

Cumulative: weak (method Lim et al., W / w, 30 days., Rat).

The clinical picture of acute poisoning: a short-term excitement, alternating with depression, muscle weakness, loss of motor coordination, cramps, sore throat, cough, breathing rhythm disturbances, abdominal pain, diarrhea.

The most injured organs and systems: central nervous system, lungs, upper respiratory tract, gastrointestinal tract, liver, kidneys, spleen, adrenal glands, violation of sodium exchange.

Concentration, have minimal toxic effects:

Limir = 60-70 mg / m<sup>3</sup> (rat, inhalation, round the clock to change the frequency of respiration and cellular response of the lungs and upper respiratory tract).

Limac = 200 mg / m<sup>3</sup> (rat, inhalation, 4:00; for systemic toxicity).

LDLo = 750 mg / kg (man - woman, orally: toxicity - convulsions or state before cramp; by KZHT - hyperkinesia, diarrhea).

LDLo = 3000 mg / kg (mice, rats, guinea pigs, and in / ww; / p; toxicity - ataxia, tonic convulsions, respiratory depression).

Irritability: leather: yes (rat, the native material; poor response). Eyes: yes (rabbit, 50 mg once daily; poor response). Inhalation: Yes.

Skin-resorptive action: not found (rats, n / a, 4:00. X 10 days, "the tail method").

Sensitizing effect: the information is not revealed.

Embryotoxicity: information is not revealed.

Gonadotoxic action: information is not revealed.

Teratogenicity: The information is not revealed.

Mutagenic effect: not found (Escherichia coli: negative; Ames test: negative).

Carcinogenic effects: people: information is not revealed. Pets: information is not revealed.

Evaluation IARC (IARC): not included in the lists of IARC.

Hygienic standards and features of effects on the body

Atmospheric air: standard is not installed. By analogy with potassium sulfate, recommended shoes = 0.04 mg / m<sup>3</sup>.

Workplace air: PDK<sub>rz</sub> = 10 mg / m<sup>3</sup> (a); Hazard Class III.

Water VOHPKBV: MPC<sub>w</sub> = 500 mg / l (Org. [Privk.]) (As SO<sub>4</sub> ++); hazard class IV.

According to the classification by the danger of contamination of water (WGK, Germany) substance is assigned to Class 1 (Low hazard substances in relation to water pollution).

Water RCE: for potassium. PDK<sub>rh</sub> = 50 mg / l (san.-tox); 10 mg / l (for ponds with a salinity of up to 100 mg / l); 390 mg / l (for marine reservoirs at a salinity of about 13-18%); (Tox.); hazard class IVe.

Skin: The standard is not installed.

Food: the specification is not installed.

Soil: The standard is not installed.

#### Hazard classes

Atmospheric air: standard is not installed.

Workplace air: III.

Water: IV / IVe.

#### First aid for poisoning

General measures: rest, warm, comfortable position, access to clean air conditions for unconstrained breathing.

Inhalation: Rinse nose and throat with water, warm milk or mineral water; with a strong cough - mustard on his chest and back. When dyspnea give humidified oxygen or carbogen, apnea, apply artificial respiration.

Ingestion: wash out the stomach with water or milk with egg white, if washing is not possible - abundant water intake, followed by induced vomiting. Inside - whipped egg whites, milk, vegetable oil.

Eye contact: long-term (10-20 min.) Washing with running water. Instill 2% novocaine solution and 0.25% solution of chloramphenicol followed by a conjunctive bag of sterile vaseline oil or peach.

Sunglasses.

Skin contact: Remove and remove contaminated clothing, shoes and equipment. Under running water to remove any remaining product. Wet dressing with rivanola solution (1: 1000) or furatsilina.

#### Environmental security

Stability in abiotic conditions ( $\tau_{1/2}$ ): > 30 days (extremely stable).

Transformation in the environment: no.

Biological dissimilation [DB = (BOD<sub>5</sub>: COD) • 100%]: <10% (almost no breaks).

Biological oxygen demand: not applicable.

Chemical Oxygen Demand: Not applicable.

Acute toxicity to fish: CL<sub>100</sub> = 869 mg / l (*Spinachia spinachia*; 96 hours). CL<sub>50</sub> = 1692444 ug / L (*Alburnus alburnus*; 96 hours). CL<sub>50</sub> = 653-796 mg / l (*Lepomis macrochinis*; 96 h).

Acute toxicity to *Daphnia magna*: EC<sub>50</sub> = 890 mg / l (48 hours).

Toxic effects on algae (in culture): IC<sub>50</sub> = 2900 mg / l (*Desmodesmus subspicams*; 72 hours).

Toxic effects on soil invertebrates: No information available.

### e) **monopotassium phosphate**

Product Name: monopotassium phosphate - MKR.

Application: fertilizer.

Hazard identification:

Labelling according to EC Directives: according to Directive 67/548 / EEC - non-hazardous product. This material is not classified in Annex 1 to Directive 67/548 / EEC.

Effects on human health: no data.

Molecular Formula:  $\text{KH}_2\text{PO}_4$ .

First aid measures: data not available.

Fire-fighting measures: while in the hearth fire decomposes. Non-flammable material.

Measures in case of accidental releases: Do not breathe. Gather, submit to destruction. Areas affected, clean.

Handling and storage:

- Handling: Keep away from heat, sources of ignition and fuel and lubricants.

- Storage: tightly closed. Storage temperature: from + 150C to + 250C.

Exposure Controls / Personal Protection: Protective clothing should be selected specifically allowing for the working place, depending on concentration and quantity of hazardous substances treated. Persistence of protective equipment to chemicals should be confirmed by the respective supplier.

Respiratory protection: required when aerosols.

Eye protection: required.

Hand protection: Gloves. Protective gloves to be used must comply with the requirements of the EU Directive 89/686 / EEC.

Good industrial hygiene: replace contaminated clothing. Use protective cream. Wash hands after working with substance.

Physical and chemical properties:

Form: solid;

Density: (w200S) 2,34 g / cm<sup>3</sup>;

The level of pH (r-r 50 g / l) 4,4;

Melting point: 253.0 0C.

Toxicological information:

- Eye contact: slight irritation;

- When ingested dust: Symptoms of respiratory irritation;

- If swallowed: nausea, vomiting.

Careful handling of the product.

Environmental information: data preparation influence on the environment are not available.

Disposal of waste: packing destroyed in accordance with national regulations or sent for processing to packaging waste recycling system.

Transportation: international rules w / e and transport hazardous commodities do not apply. Transport in accordance with international rules.

### f) **Urea**

Chemical name: karbonildiamid.

Molecular formula:  $\text{CH}_4\text{-N}_2\text{-O}$  or  $(\text{NH}_2)_2\text{CO}$ .

The structural formula is:  $\text{H}_2\text{N- (CO) -NH}_2$ .

Synonyms: urea, carbonic acid diamide and others.

Trade name: Urea.

Registration numbers: CAS57-13-6, RTECSVR6250000, EINECS200-315-5, Russian Register POHBV №VT000038 from 20.04.99 city, Caswell №902.

Applications: chemical industry, agricultural chemistry. Used as a concentrated nitrogen fertilizer on the soil and any other purposes.

The purity of the substance (product): 98-99% according to GOST 2081, the mass fraction of nitrogen in recalculation on dry substance  $\geq 46,2-46,3\%$  (depending on the brand and type of urea).

Impurities: biuret (typically 0.3-2%), formaldehyde (1%), water ( $\leq 0,3\%$ ), free ammonia ( $\leq 0,011\% - 0,02\%$ ).

Physico-chemical properties:

Physical state - solid.

Melting point -  $132,7^{\circ}\text{C}$ .

Density -  $1,33\text{ g/cm}^3$  (at  $25^{\circ}\text{C}$ ).

Solubility in water:  $51.8\text{ g/100g}$  at  $20^{\circ}\text{C}$ .

Smell - no.

Volatility - not volatile under standard conditions.

Incompatibility with substances - strong oxidizing agents and hypochlorites.

Hazardous decomposition products: ammonia, nitrogen oxides, carbon monoxide, carbon dioxide, biuret.

Interventions for spills and spills: Collect in closing inscribed container. Contaminated area with water.

Disposal (neutralization): Returns to the production cycle. Fire decontamination, disposal.

Risk of ignition and combustion temperature flash -  $182^{\circ}\text{C}$ , the ignition temperature of -  $223^{\circ}\text{C}$ , ignition temperature -  $470^{\circ}\text{C}$  (airsuspension).

When heated, it emits acrid and toxic fumes and gases.

Information on the temperature limits of flame propagation is absent.

The products of ammonia, nitrogen oxides.

Extinguishing Media: water with a wetting agent, air - mechanical foam, carbon dioxide, refrigerants, sand, gravel, powders P-2AP, PF.

Special fire safety measures: a jet of water supplied from a safe distance.

Toxicity:

Acute toxicity -  $DL_{50} = 847\text{ mg/kg}$  (orally - rat),  $DL_{50} = 8200\text{ mg/kg}$  (subcutaneous - rats).

Cumulatively - weak.

The clinical picture of acute poisoning include nausea, vomiting, seizures, difficulty breathing, cyanosis of the skin.

The most injured organs and systems: the nervous system, blood, respiratory system, liver, kidneys, pancreas.

Irritability: Leather - yes (people), eyes - yes (rabbit), respiratory tract (difficulty, shortness of breath).

Skin - resorptive action: yes (guinea pig, rabbit).

Carcinogenic effect of man - the information is not available, the animals - yes (mouse).

Hygienic standards and features of effects on the body:

Atmospheric air:  $PDK_{av} = 0.2\text{ mg/m}^3$  (RHCs.).

Water RCE:  $PDK_{rh} = 80\text{ mg/l}$  (san.-tox).

Workplace air:  $PDK_{rz} = 10\text{ mg/m}^3$ .

Skin: The standard is not installed.

Food: the specification is not installed. It is used as a food additive (code E927V).

Soil: The standard is not installed.

Hazard Class: Air - hazard class IV, workplace air - Hazard Class III, water - hazard class IV.

First aid measures.

First aid for poisoning:

General measures: rest, warm, clean air access.

Inhalation: Rinse accessible mucous membranes of the respiratory tract of warm water.

Ingestion: Clean mouth from the remnants of the product. Abundantly drink water, give activated charcoal, saline laxative.

Eye contact: Rinse the cavity of the conjunctiva with warm running water at a wide-open eye socket.  
 Skin contact: Remove and remove contaminated clothing, shoes and equipment. Wash the affected areas with water.

Environmental security

Transformation in the environment - yes.

Transformation products - ammonia, nitrates, carbon dioxide.

Acute toxicity to fish - CL50 > 10,000 mg / l.

The toxic effect on algae (culture): CLmin > 10,000 mg / L (168 hours).

Toxic effect on subsoil vertebrates - no information available.

Conditions of storage, transportation and use.

Special precautions during transportation, handling and storage: Store in airtight containers manufacturer inscribed in covered, dry, ventilated warehouses, protected from ingress of precipitation, away from heat and open flame. Protect from direct sunlight.

Transportation: carried by all modes of transport, in accordance with the applicable rules.

Incompatibility with substances: Strong oxidizers and sodium hypochlorite nitrate, potassium nitrate, chloride, etc. hromid contact with the nitric acid formed explosive urea nitrate.

Personal protective equipment - respirators RU-60m-B, RU-60m-CD, Y-2K, RAP-1, the RPG-67. Masks brand of CD and M GOST 12.4121. Safety goggles, rubber knitted gloves.

### **g) Boric acid**

Chemical name: boric acid.

Molecular formula: H<sub>3</sub>BO<sub>3</sub>.

Degree of purity: 99.6%, the rest - water 0.2%.

Safety requirements in accordance with GOST 4523-77.

Properties: white salt is soluble in water.

Non-flammable, non-flammable, non ignites spontaneously. When working with the substance should be taken of personal hygiene, avoid contact with the inside of the body. The substance may cause skin disease.

### **h) Magnesium sulfate**

Chemical Name: magnesium sulfate.

Molecular formula: MgSO<sub>4</sub>.

Degree of purity: 98.4%, the rest - water 0.5%.

Safety requirements in accordance with GOST 4523-77.

Properties: white salt is soluble in water.

Non-flammable, non-flammable, non ignites spontaneously. In the analysis using the fuel gas should comply with fire safety measures. When working with the substance should be taken of personal hygiene, avoid contact with the inside of the body. The substance may cause skin disease.

### **i) Trace elements (microelements)**

To create the complexes of microelements of iron, zinc, manganese, copper, molybdenum, boron, ethylenediaminetetraacetic acid is used, more - EDTA.

EDTA is a complex containing a carboxyl group.

Microelements Cu, Fe, Zn, Mn, Mo-based chelate used.

Chelation - complex organic compounds are readily soluble in water, ensuring high availability of said trace plants.

Trace elements are necessary for normal functioning of plants and used in micro, compared with the basic elements of nutrition.

Trace elements are hazard class IV (low hazard substances).

If you use rubber gloves must be used. At the end - wash your hands.

First aid.

After contact with skin - wash with water.

In case of contact with eyes - rinse with plenty of water.

After ingestion - drink 3-5 glasses a weak solution of potassium permanganate, induce vomiting. Seek medical advice.

Decontamination and destruction of trace residues, and spill spillage:

Remains of decontamination can not be.

Destruction is carried out by ten-fold dilution with water. Container must be reused. Spills and wastage rinsed off with water.

Storage conditions:

Store in container with a clear label of the reach of children and pets, at a temperature not below - 10 ° C.

Trace elements are not combustible, non-flammable.

#### **Section 4. First aid measures.**

General measures: rest, warm, comfortable body position, ensure access of clean air conditions for unconstrained breathing.

If swallowed: Rinse mouth with water. Provide plenty of drink, induce vomiting, give activated charcoal, saline laxative.

Inhalation: Remove the patient from the affected areas to provide access of fresh air.

When dyspnea: give humidified oxygen.

Apnea: apply artificial respiration. If necessary, the victim must be taken to hospital for medical care.

After eye contact: rinse thoroughly with conjunctival cavity with warm running water at a wide-open eye socket, consult a doctor.

After contact with skin: Remove residues of a substance to remove contaminated clothing, footwear, equipment. Wash the affected areas with plenty of water.

The consequences of the impact of the product on the human body as a result of poisoning: not identified.

## **Section 5. Measures Fire-fighting.**

Fertilizer is a mixture of fire and explosion safety components. No burning, no flammable, not spontaneous combustion.

It is necessary to avoid contact with combustible materials, acids and organic substances.

Extinguishing agents are selected depending on fire and explosive properties of combustible materials in the zone of fire with this product.

Special fire safety measures not.

Possible thermal degradation. In this form the products - ammonia, phosphorus oxides, carbon monoxide, carbon dioxide, oxygen.

## **Section 6. Measures to prevent and eliminate accidents and emergency situations and their consequences.**

Fertilizer should be stored in closed, dry warehouses. Containers must be kept tightly closed. Packaging - plastic bags - sealed, polypropylene - sewn, big bags (big bags) are closed.

Transportation by rail or road.

Prohibited transportation, storage of fertilizers with combustible substances, acids and organic substances.

Transport labeling GOST14192-77 with drawing manipulation sign "Keep away from moisture", "Keep away from sunlight."

Events with spillage: Collect in closed containers. Contaminated area with water.

Neutralization - return to the production cycle, burial in designated areas.

Personal protective equipment - respirators such as "petal" or the CC-2. Goggles, protective clothing and footwear, rubber gloves.

## **Section 7. Rules storage of chemicals and handling during loading and unloading.**

The composition of the degree of influence on the body belongs to III class of danger and is a substance that is moderately safe, according GOST121.007.

The components that make up the fertilizer have on the human body general toxic effect, cause irritation of the mucous membranes of the eyes, upper respiratory tract, skin. Permissible concentration of fertilizer in the working area is not defined. Fertilizer packed in sealed plastic bags, laminated PP bags or other containers, with the current regulations. Product weight in bags of 25 kg and 50 (and possibly other, as agreed with the customer).

Shelf life - 1 year for farmers and 2 years - for retailers.

Fertilizer should be stored in closed, dry warehouses. Prohibited storage of flammable substances, acids and organic substances.

When storing the finished product must comply with the rules of storage:

- The integrity of the packaging;
- Protection from the sun's rays;
- Temperature range for storage of plastic bags from -10 ° C to + 35 ° C, for polypropylene between -25 ° C to + 35 ° C.

Safety precautions when moving and transportation: protection against damage of container.

Environmental precautions: preventing spillage of product into the soil, waterways, drains.

Limit on the amount of stored product no.

Special measures to create special storage is required, subject to the requirements set forth in this sheet and regulations.

## **Section 8. Exposure control and personal protection.**

Control over the storage of fertilizers, packaging integrity, method and amount of application to the soil, carried out according to a schedule approved by the head of the company - the owner of the production, according to the requirements of GOST 12.1.005.

Contents of aerosols fertilizers in the working area (case damage to the container) should not exceed 5 mg / m<sup>3</sup>, lead - 0.005 mg / m<sup>3</sup>, cadmium - 0.01 mg / m<sup>3</sup>, arsenic - 0.01 mg / m<sup>3</sup>.

In production and storage facilities is prohibited possession and use of food.

Personal protective equipment Personnel: respirators such as "petal" or the CC-2, goggles, overalls and boots, rubber gloves.

## **Section 9. Physical and chemical properties of the fertilizer.**

Physical State: Powder white or gray-white color.

Odour: imperceptible.

Melting / freezing point: indications are unrelated to fertilization.

Initial boiling point: indications are unrelated to fertilization.

Flash point: does not burn.

Ignition temperature: not burn.

Auto-ignition temperature: not burn.

Decomposition temperature: Not determined.

Upper / lower explosion limit or explosive limits: off / not explode.

Density: not available.

Volatility: non-volatile.

Viscosity: indications are unrelated to fertilization.

The water-soluble indicator (PH) according to the concentration of the solution.

Solubility: completely soluble fertilizer in water.

Partition coefficient n-octanol / water: not investigated.

## **Section 10. Stability and reactivity.**

Chemical stability: fertilizer under standard conditions of manufacture and storage does not polymerize, not oxidized, can not be photodestruction.

Possibility of hazardous reactions under standard conditions of manufacture and storage possibility of hazardous reactions available.

Conditions to avoid: Static discharge under a cloud aerosols.

Incompatible materials: Do not mix with acids, combustible materials, organic (sawdust, wood, etc.)

Hazardous decomposition products: under standard conditions of manufacture and storage available.

## Section 11. Toxicological information.

Inhalation impact: A study of acute inhalation toxicity fertilizer was carried out. LC50 close analogues Novofert fertilizers (nitrogen-phosphorus-potassium) more than 2000mg / m<sup>3</sup> (for white rats).

Chronic effects of P<sub>2</sub>O<sub>5</sub> at a concentration of 0.01-0.08 mg / l (in white rats) causes different lesions of the respiratory tract; swelling of the mucous membrane of the trachea, pulmonary thrombosis.

Hit urea through inhalation at a concentration 1900 mg / m<sup>3</sup> does not cause intoxication and death of animals.

Threshold Concentrations (mg / m) of the person:

The threshold concentration of fertilizer were found. The odor threshold of ammonia - 0.5 mg / m. At a concentration of 40-80 mg / m<sup>3</sup> - a sharp irritation of the upper respiratory tract, may be respiratory arrest.

Introduction into the stomach:

Fertilizer (mark Novofert) was not determined.

When injected into the stomach in rats mixture KNO<sub>3</sub> and NH<sub>2</sub>NO<sub>3</sub> (10 and 100 mg / kg) in 10 days marked methemoglobinemia, stunting, violation embrioneza.

Applying to the skin and mucous membranes:

LD50 in rats is not established. Prolonged contact with skin and eyes causes irritation. The cumulative effect of fertilizer is not known. Sensitization effect of fertilizer was not determined.

## Section 12. Information on the impact on the environment.

Subject to the rules of transportation, storage, loading and unloading operations and the use of technology, pollution of water bodies of water, soil and the atmosphere is unlikely.

However, contamination:

- Air dust the finished product in violation of the process;
- Water reservoirs with swabs from the fields;
- Soil and crop rainwater for non-compliance of doses and application technologies make fertilizer.

The highest content of water and acid-soluble forms of fertilizers characterized by zinc, lead and copper. The amount of water-soluble forms of zinc was 1.5 mg / kg, and the amount of acid of 3.0 mg / kg of lead and 1.2 to 2.5 mg / kg, of copper 1.0 to 2.0 mg / kg, respectively. The content of heavy metals in NPK fertilizers does not exceed ecotoxicological standards and evidence-based doses does not change as gross and moving of heavy metals in the soil.

The migration of heavy metals on unpaved profile is one of the most important eco-toxicological criteria. A decrease in the intensity of the transition of zinc and copper, winter wheat in the "soil-plant" with the use of fertilizers, compared with the control systems. Thus, the transition coefficient of copper decreased from 3.3 to 1.0 in the control - 3.0 on the variants with fertilization.

Similarly for zinc.

The excess of the established norms of MPC for movable and potentially movable forms of Fe, Cu, Zn, Mo in soils has been established.

Hygienic (HDV):

IN THE WORKPLACE:

Urea - 10 mg / m<sup>3</sup>.

The air of the atmosphere:

urea 0.2 mg / m<sup>3</sup>.

P<sub>2</sub>O<sub>5</sub> (phosphorus oxide) 0.05 mg / m<sup>3</sup>.

NH<sub>4</sub>NO<sub>3</sub> (ammonium nitrate), 0.3 mg / m<sup>3</sup>.

CuO - 0,002 mg / m<sup>3</sup>.

ZnO - 0,05 mg / m<sup>3</sup>.

Ni - 0,0002 mg / m<sup>3</sup>.

Pb (lead) - 0.003 mg / m<sup>3</sup>.

Mn - 0.3 mg / m<sup>3</sup>.

Fe - 0,04 mg / m<sup>3</sup>.

In soil:

P<sub>2</sub>O<sub>5</sub> - 200 mg / m<sup>3</sup>.

NO<sub>3</sub> - 130 mg / kg.

Pb - 6 mg / kg.

Cu - 3 mg / kg.

Zn - 23 mg / kg.

Cd - 0,7 mg / kg.

Co - 0 mg / kg.

In foods:

Pb (lead) fruit - 0.4 mg / kg, grain - 0.2 mg / kg; Vegetables - 0.5 mg / kg;

Cu (copper) berries - 5.0 mg / kg, fruit - 0.4 mg / kg; Vegetables - 0.5 mg / kg, grain - 5.0 mg / kg;

Zn (zinc) berries - 10 mg / kg, fruit - 10 mg / kg; Vegetables - 10 mg / kg of grains - 25 mg / kg;

Cd (Mg) berries - 0.03 mg / kg;  
Nitrates 60 mg / kg (tomatoes on the open field);  
2400 mg / kg (greenhouse leafy vegetables).

In the water reservoirs for household purposes.

P (phosphorus) - 0.0001 mg / dm<sup>3</sup>;  
Ammonium nitrate (in N) - 2 mg / dm<sup>3</sup>;  
nitrate - 45 mg / dm<sup>3</sup>;  
carbamide - 0.1 mg / dm<sup>3</sup> (general health);  
Co (cobalt) - 0.1 mg / dm<sup>3</sup>;  
Ni - 0,1 mg / dm<sup>3</sup>;  
Cu - 1,0 mg / dm<sup>3</sup>;  
Cd - 0,001 mg / dm<sup>3</sup>;  
Pb - 0,03 mg / dm<sup>3</sup>;  
Zn - 1,0 mg / dm<sup>3</sup>;  
Mn - 0,1 mg / dm<sup>3</sup>;  
Fe - 0 mg / dm<sup>3</sup>.

### **Section 13. Disposal of waste (residues).**

Disposal of waste fertilizers: must be carried out according to SanPiN 1.2.1077-01 "Hygienic requirements for storage, use and transportation of pesticides and agrochemicals" and JV 1.2.1170-02 "Hygienic requirements for safety of agrochemicals." (Fertilizers), which ended the period of storage, packaging intact sent to the factory - for neutralization technology manufacturer. Inadequate fertilizer and placers are also sent for processing to the manufacturer products.

Heavily clogged placer products are sent for disposal or decontamination.

Heavily contaminated fertilizer plots wash with plenty of water.

Packaging (bags, big bags), contaminated fertilizer is sent to special polygon for burial or plants for recycling.

## **Section 14. Information (air transport).**

On indicators and criteria related to dangerous goods set out in the "Recommendations on the Transport of Dangerous Goods. Model Regulations (Part 1) ST / SG / AC.10 / 1 / Rev.16, «the Globally Harmonized System of Classification and Labelling of Chemicals" (GHS), and according to expert opinion № 102. GB-139.10 from 17.03. 2010 «Ukrainian cargo bureau" of the Ministry of Transport and Communication Water-soluble NPK fertilizer with trace elements (brand Novofert) do not apply to dangerous goods and are not subject to the rules of transportation of dangerous goods, which act on the appropriate means of transport.

Fertilizer packed transported by rail, road and river transport in accordance with the rules that apply to this type of transport.

By rail packaged goods sent by wagon loads.

Labeling bags, containers must be carried out according to GOST 14192 with the application of the manipulation sign "Keep away from moisture."

Transport labeling must be performed in a manner that preserves the information throughout the life of transportation and storage.

Marking is performed in the language of the country specified in the contract.

Prohibited the transportation of fertilizer together with combustible substances, acids. It is prohibited in the transportation mix fertilizer with sawdust, coal and other organic substances in order to prevent spontaneous combustion.

Subject to the rules of transportation, storage and handling operations, pollution of sea, river basins excluded.

## **Section 15. Additional Information.**

List of sources used in compiling the safety data sheet:

GOST 30333-2007.

Regulation (EC) of the European Parliament and of the Council №1907 / 2006.

ADR (ADR).

SanPin 1.2.1077-01 "Hygienic requirements for storage, use and transportation of pesticides and agrochemicals."

JV 1.2.1170-02 "Hygienic requirements for safety of agrochemicals."

Toxicological and hygienic passport in a water-soluble NPK fertilizer with trace elements (mark Novofert), developed by the Institute Ecohygiene and Toxicology. LI Bear Ministry of Health of Ukraine.

Specifications TU U 24.1-34086363-001: 2009 rev. Number 1, rev. Number 2 "water-soluble NPK fertilizer with trace elements (mark Novofert)."

Chemical Encyclopedia Volume 1, M: SE.1988 city

GOST 12.4.034-85. Personal respiratory protection.

GOST 12.4.103-83. Special protective clothes, personal protective feet and hands.

Harmful chemicals L.Himiya 1989

GOST 2081-92 Urea. Technical conditions.

Specifications TU 2148-002-48590531-05. Monoammonium purified.