Translation from Russian

MATERIAL SAFETY DATA SHEET

Entered on the Register of MSDS

MSDS reg. No. 5 0 2 7 7 5 6 3 . 2 0 . 4 5 5 4 7.B

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Informational and Analytical Center
Safety of Substances and Materials
of FGUP Standartinform
(Federal Agency for Technical Regulating and Metrology)

Director of Department
for Standartisation
of Materials and Technologies _____ /E.I. Vyboichenko/
company seal

NAME

technical (acc. to TU)	**Technical Polyanionic Cellulose**
chemical (acc. to IUPAC)	None
commercial	Tehnical Polyanionic Cellulose, grades: *PAC-LV, PAC-HV*
Synonyms	High-Substituted Sodium Carboxymethyl Cellulose (Na-CMC)

Russian National product classification code	**CN (customs tariff) code**
20.16.59.240	3 9 1 2 3 1 0 0 0 0

Identification code and name of the regulatory, technical or informational document for the material (GOST, TU, OST, STO, (M)SDS)

TU 20.16.59-011-50277563-2019 Technical Polyanionic Cellulose

HAZARD CHARACTERISTICS

Signal word **Caution**

In brief (verbal):

Moderately dangerous for the effects on the body products – 3 hazard class according to GOST 12.1.007. Harmful if inhaled. In contact with skin and eyes causes irritation. Combustible substance. May cause long-term adverse effects on aquatic organisms.

In detail: in 16 sections of the attached Material Safety Data Sheet

MAIN HAZARDOUS COMPONENTS	Work area TLV, mg/m^3	Class of hazard	CAS number	EC number
Sodium Carboxymethyl Cellulose	10	3	9004-32-4	618-378-6
Sodium Chloride	5	3	7647-14-5	231-598-3

APPLICANT JSC Karbokam (company name) Krasnokamsk, Perm Krai (city)

Type of Applicant manufacturer, supplier, seller, exporter, ~~importer~~ (delete if not applicable)

ОКПО Code 5 0 2 7 7 5 6 3 **Emergency phone number** 8 (34273) 7-29-72

Manager of the Applicant _____ / M.V. Panfolov /
(signature) (printed)

Company seal

The Material Safety Data Sheet is in compliance with UN Recommendations ST/SG/AC. 10/30 GHS

IUPAC	– International Union of Pure and Applied Chemistry
GHS (СГС)	– UN Recommendations ST/SG/AC.10/30 Globally Harmonized System of Classification and Labelling of Chemicals
ОКПД 2	– Russian National Classification of Products by Economic Activities
ОКПО	– Russian National Classifier of Enterprises and Organizations
ТН ВЭД	– Harmonized Commodity Description and Coding System
CAS No.	– Substance number in the Chemical Abstracts Service Register
EC No.	– Substance number in the European Chemicals Agency Register
Workplace TVL (ПДК р.з.)	– workplace threshold limit value, mg/m^3
Signal word	– a word used for focusing on chemical substance danger level and used in accordance with GOST 31340-2013

Translation from Russian

1 Chemical Product Identification and Information on Manufacturer and/or Supplier

1.1. Chemical Product Identification

1.1.1. Technical name	Technical Polyanionic Cellulose /1/.
1.1.2. Recommendations on application, in brief (incl. application restrictions)	Intended for use in oil and gas extraction industries to control fluid loss and rheologic properties of drilling muds / 1 /.

1.2. Manufacturer and/or Supplier Information

1.2.1. Full official name	Joint-Stock Company Karbokam
1.2.2. Address (postal and legal)	Postal: 11 Shosseinaya Street, Krasnokamsk, Prem Krai, 617060, Russia Legal: 11 Shosseinaya Street (main building, separate entrance), Krasnokamsk, Prem Krai, 617060, Russia
1.2.3. Telephone, including for emergency guidance, and time limitations	+7 (34273) 7-29-72 (7.00 a.m. to 15.00 a.m. Moscow time, information on hazardous exposures and first aid).
1.2.4. Fax	+7 (34273) 4-64-92
1.2.5. E-mail	info@karbokam.ru

2 Hazard(s) Identification

2.1. Chemical product hazard level in general (data on hazard classification in compliance with RF regulations (GOST 12.1.007-76) and GHS (GOST 32419-2013, GOST 32423-2013, GOST 32424-2013, GOST 23425-2013)	Moderately hazardous goods as per GOST 12.1.007 /2/. Classification as per GHS: - chemical products having acute toxicity on human body by inhalation – class 4; - chemical products causing dermhelminthiasis (necrosis)/irritation – class 3; - chemical products causing severe eye damage/irritation – class 2B; - chemical products having chronic toxicity for aquatic environment – class 4 / 24-27/.

2.2. Warning Instructions as per GOST 31340-2013

2.2.1 Signal word	Caution / 3 /.
2.2.2 Hazard (signs) symbols	 Exclamation mark /3/.

2.2.3 Hazard statement in brief (H-statements)

H-332: hazardous by inhalation;
H316: causes mild irritation in case of contact with skin;
H320: causes irritation in case of contact with eyes;
H413: can cause long-term backlash on aquatic organisms /3,51/.

3 Composition (Data on Components)

3.1. General data on the product

3.1.1. Chemical name (as per IUPAC)

None for the product as a whole / 1 /.

3.1.2. Chemical formula

None for the product as a whole / 1 /.

3.1.3. General composition characteristic (with consideration for brand assortment and production process)

Technical Polyanionic Cellulose with brand names *PAC-LV* and *PAC-HV* is a product based on high-substituted sodium carboxymethyl cellulose, containing chemical impurities. Production process comprises reacting alkali cellulose with monochloracetic acid or its sodium salt in the system of the organic solvent – ethanol / 1 /.

3.2 Components

(name, CAS and EC numbers, weight content (100% in the whole, workplace TLV. or SRLI, hazard classes, references to the sources)

Table 1 (2, 4, 5, 11)

Components (name)	Weight content, %	Occupational exposure standards		CAS No.	EC No.
		Workplace TLV, mg/m^3	Class of hazard		
Sodium carboxymethyl cellulose	not less than 60	10 a	3	9004-32-4	618-378-6
Sodium chloride	not more than 27	5 a	3	7647-14-5	231-598-3
Sodium glycolate	not more than 8	not applicable	not classified	2836-32-0	220-624-9
Sodium carbonate +	not more than 0,5	2 a	3	497-19-8	207-838-8
Caustic soda +	not more than 0,5	0,5 a	2	1310-73-2	215-185-5
Water	not more than 10	not applicable	not classified	7732-18-5	231-791-2

Note:
The substances are present in the end product in concentrations specified in the table.
a – principal state of aggregation of the matter in the production working area is aerosol;
+ – safety protection of eyes and skin is necessary.

4 First Aid Measures

4.1. Symptoms observed

4.1.1. Inhalation (when drawn through breathing)	Itchy throat, huskiness /1, 5, 11, 13 /.
4.1.2. Contact with skin	Redness, itching / 1, 5, 6, 11, 13 /.
4.1.3. Contact with eyes	Redness, lacrimation / 1, 5, 6, 7, 11, 13 /.
4.1.4. Ingestion (when drawn through swallowing)	Abdominal pains, nausea / 1, 5, 6, 7, 11, 13 /.

4.2. First aid measures

4.2.1. Inhaled poisoning	Flush nasal and oral cavity with water, take to fresh air, keep at rest. If condition is deteriorating, get medical aid / 1, 5, 11, 29-31 /.
4.2.2. Contact with skin	Wash with soap and water / 1, 5, 11, 29-31 /.
4.2.3. Contact with eyes	Rinse with plenty of flowing water. If irritation remains, get medical aid / 1, 5, 11, 29-31 /.
4.2.4. Oral poisoning	Drink plenty of warm water or milk, take to fresh air, keep at rest, get medical aid / 1, 5, 11, 29-31 /.
4.2.5. Counter indications	No data / 1, 5, 11, 29-31 /.

5 Fire-Fighting Measures

5.1. General information on fire and explosion hazards (as per GOST 12.1.044-2018)	Flammable (combustible) substance. Explosive dust / 1, 9 /.
5.2. Fire and explosion hazards (tested parameters as per GOST 12.1.044-2018 and GOST 30852.0-2002)	Selfignition temperature: aerogel 260 °C airborn dust 350 °C / 1 /. Lower concentration flame spread 60 g/m^3 / 8 /. Maximum explosion pressure 880 kPa / 1 /. Maximum speed of pressure rise 30 MPa/s / 1 /. Minimal energy of ignition 140 mJ / 1 /. Maximum explosive oxygen concentration 16 w/w% / 1 /.
5.3. Products of combustion and/or thermal decomposition and hazards brought about by them	*Carbon monoxide* (sweet damp) causes failure of oxygen delivery to the body tissues. Slow combustion and lack of oxygen facilitate its release. Concentration of 0.2 to 1 % vol. results in death of a man within 3 to 60 minutes / 8 / . *Carbon dioxide* (choke damp) causes accelerated breathing and rise of pulmonary

	inhalation, results in vasodilatation, takes effect on blood pH drift. Concentration of 12 % vol. results in unconsciousness within a few minutes. Concentration of 20 % vol. results in immediate unconsciousness and death / 8, 29, 32, 33 /.
5.4. Recommended fire-fighting equipment and materials	Small fire: powder fire extinguishers, sand, fire blanket. Big fire: water spray with wetting agents, air-filled foam / 1, 8, 29, 32, 33 /.
5.5. Unallowable fire-fighting equipment and materials	Finely-divided product: high-pressure water stream / 1, 8, 29, 32, 33 /.
5.6. Personal protection clothing/equipment when fighting fire (fire fighters' PPE)	Special fire fighters' clothing and equipment, isolating breathing apparatus (of РКК or КИП type); in case of strong heat emission – fire-protection suit / 8, 29, 30, 42 /.
5.7. Fire-fighting specific features	Containers with fire- and explosion-hazardous materials are cooled with water from a safe distance. Packing materials (polyethylene film, polypropylene and paper bags) are flammable. Suggested fire-fighting means are water spray with wetting agents, air-filled foam / 8, 29, 30 /.

6 Preventive and Recovery Measures in Case of Emergency

6.1. Measures preventing hazardous influence on humans, environment, buildings etc. in case of emergency

6.1.1. General necessary actions in case of emergency	Remove bystanders from the hazardous area and seal it off. When coming into the zone of emergency, use personal protection equipment and clothing. Follow fire prevention instructions. Do not smoke. Remove sources of open fire. Give first aid to the injured /49/.
6.1.2. Personal protection equipment (PPE) in case of emergency (PPE for emergency brigades)	Breathing apparatuses: filtering ones of БКФ and CO types, isolating ones of РКК and КИП types; a respirator, cotton or rubber protective gloves, overall (see Sections 5 and 8).

6.2. Operational procedures in emergency situations

6.2.1. Actions to remove leakages, scattering (including accidental release measures and precautionary measures ensuring environmental protection)	In case of scattering seal off the hazardous area, use personal protection equipment. Eliminate source of fire and sparkling. Do not smoke. Collect the scattered product as much as possible and direct it to recycling or disposal. Remove the residuals according to the local regulations. / 1, 5, 29, 30 /. Flush the affected area with water, preventing flowing the washing water into water bodies and soil; washing water should be directed to biological

	treatment. Make tests of MAC. In case of soil pollution, collect the contaminated soil and forward it to dumping / 1, 29, 30 /.
6.2.2. Fire action procedure	Seal off the hazardous area, use the complete protection clothing. If possible, remove the product from the fire zone. Extinguish with spray water, air-filled foam / 8/, in closed containers with inert gases / 9, 29, 30 /.

7 Storage and Handling of the Chemicals

7.1. Safety precautions to be taken when handling chemicals

7.1.1. Protective engineering measures	Production premises must be equipped with general forced ventilation, dust-forming units and equipment – with local suction equipment to ensure MAC in working areas. Equipment and pipes must be leakless and static-safe. Generation and accumulation of dust must be minimized. / 1, 34, 35, 39-41 /.
7.1.2. Environmental protection measures	Avoid material entering bodies of water (see Section 12).
7.1.3. Recommendations on safe handling and transporting	Subject to transportation being duly packed and palletized, by all means of roofed transport in accordance with the shipping rules in force for these means of transport / 1 /.

7.2. Storage regulations for chemicals

7.2.1. Safe Storage Conditions and Time (including guaranteed storage and shelf lives)	Store packed on pallets in dry and closed storage areas. Storing of packed product in hard-surface open storages with sheds / 1, 5 /. Guaranteed storage life is 1 year from the manufacture date / 1 /. Prevent contact with oxidants and moisture, including atmospheric/ 1, 5 /.
7.2.2. Packing and Wrapping Materials (including their raw materials)	4- or 5-ply paper bags of НМ, БМ, ПМ types; lined polypropylene valved bags; single-use soft containers. Unit loads are formed on wooden pallets wrapped in shrinking foil / 1 /.
7.3. Safety measures in household use	Not used in household /1 /.

8 Hazardous Exposure Control Means and Personal Protection Equipment

8.1. Workplace parameters subject to compulsory control (workplace TLV or SRLI)	*Sodium Carboxymethyl Cellulose:* Workplace TLV = 10 mg/m^3 / 2, 4 /.

8.2. Exposure controls	Area total forced ventilation, local exhaustion in points of dusting. Tightness of equipment. Regular checks of the air in working areas / 1 /.
8.3. Staff Personal Protection Equipment	
8.3.1. General recommendations	Do not allow significant dust accumulation. Avoid inhalation of dust. Use personal protection equipment / 1, 36, 39-41 /.
8.3.2. Respiratory protection (RPE types)	In normal conditions: *Lepestok* and *У2-К* respirators; in emergency situations: breathing apparatuses (filtering apparatuses of БКФ, CO types or isolating ones of РКК and КИП types) / 1, 8, 36, 42-44 /.
8.3.3. Protection means (material, type) (overall, safety footwear, hand protection, eye protection)	Protective goggles of open or closed type. Cotton gloves. Cotton clothing, leather boots / 1, 36, 45-48 /.
8.3.4. Personal protection equipment when used in household	Not used in homes / 1 /.

9 Physical and Chemical Properties

9.1. Physical state (aggregate state, colour, odour)	Fine-grained or powder material of yellow to beige colour. No odor / 1 /.
9.2. Properties that characterize principal qualities of the product (temperature properties, pH, solubility, n-octanol/water partition coefficient and other parameters specific to this type of material)	Temperature, °C, of; • liquefaction/softening: 170 / 5, 7, 10 /. • charring: approx. 230 / 7, 10 /. ph of aqueous solution having 2 w/w% at 20 °C: 6,5-11 / 1 /. Solubility in water calculated as bone-dry technical product: not less than 97% / 1 /. The material is well-soluble in water/sodium chloride solutions; insoluble in organic solvents and mineral oils / 7, 10 /. Water content, mass: not more than 10% / 1 /. Degree of substitution (carboxymethyl groups): not less that 90 / 1 /. Active content in bone-dry technical product, not less that 60% / 1 /. Static fluid loss as per GOST P56946-2016, not more than 10 cm^3 / 1 /.

10 Stability and Reactivity

10.1. Chemical stability (specify products of decomposition for unstable materials)	The material is stable under normal conditions of use / 5 /.
10.2. Reactivity	Hydrolysable in alkali solutions, oxidizable, halogenizable / 5 /.
10.3. Conditions to avoid	Aerogel (aerodust) contact with a source of fire:

(including hazardous effects in case of contact with incompatible substances and materials)	open fire, sparks / 1 /.

11 Information on Toxicity

11.1. General characteristic of action (hazard (toxicity) evaluation, assessment of impact on the human body and most significant manifestation of hazards)	Substance is moderately hazardous in terms of impact on the human body. It subexcites respiratory ways, skin and eyes / 1, 2 /.
11.2. Exposure pathways (inhalation, oral, skin and eyes)	Dust subexcites upper airway mucous coats, eyes and skin. Swallowing is hazardous. Inhalation of thermal decomposition products (carbon oxides) can cause poisoning / 1, 5, 6 /.
11.3. Target organs, tissues and systems	*Sodium Carboxymethyl Cellulose:* respiratory system, gastroenteric tract, eyes / 5 /. *Sodium Chloride:* central and peripheral nervous system, cardiovascular system, mineral turnover, lungs, upper respiratory ways, liver, kidneys, gall bladder. / 11 / *Sodium Glycolate:* no data.
11.4. Information on hazardous influence on health in direct contacting with the product, as well as consequences of this influence (irritant effect on upper respiratory tract, eyes, skin, percutaneous and sensibilisating action)	Irritant effect on conjunctiva is low / 1, 5, 6 /. No percutaneous effect / 1, 5, 6 /. Irritant effect on upper respiratory tract is low / 1, 5 /. Sensibilisating action has not been discovered / 1, 5, 6 /.
11.5. Information on remote hazardous effects on the human body (influence on reproductivity, cancerogenic potency, cumulativeness and other chronic effects)	Information on the material as a whole is not available / 12, 13 /. *Sodium Carboxymethyl Cellulose:* embryotropic, gonadotripic, teratogenic or mutagenic effects are not established. Cancerogenic effect on human has not been under study; low cancerogenic effect on animals has been established, but not confirmed by IARC / 5, 14 /. Low cumulativity / 5 /. *Sodium Chloride:* has embryotropic and teratogenic effects. Mutagenic effect has been discovered but not confirmed by IARC / 11 /. Gonadotropic and cancerogenic effects have not been studied / 11 /. Low cumulativity / 11 /.
11.6. Acute toxicity properties (DL_{50}, route of entry (oral, skin), kind of animal; CL_{50}, time of exposure (h), kind of animal)	Information on the product as a whole is not available / 12, 13 /. *Sodium Carboxymethyl Cellulose:* DL_{50} = 16 000 mg/kg, oral, guinea pigs / 5 /; DL_{50} = 27 000 mg/kg, oral, rats / 5 /; CL_{50} – is not attained / 5 /. *Sodium Chloride:* DL_{50} = 4 000 mg/kg, oral, mice / 11 /; DL_{50} = 3 000 mg/kg, oral, rats / 11 /;

CL_{50} – no data / 11 /.

12 Ecological Information

12.1. General description of influence on natural environments
(atmospheric air, water bodies, soil, observable features of effect included)

The material is able to pollute different natural environments and to cause soil and water salination. When entering water bodies, the material causes sensory changes in water (off-flavour, increased turbidity).
Significant concentration can result in death of animals and plants. Concentrations of chlorides of 1500 mg/l is dangerous for cattle, sheep, pigs, domestic animals and birds; concentrations of above 4000 mg/l may result in their death. Chlorides in concentrations of 100 to 350 mg/l have a toxic effect on plants / 15 /.
Sodium chloride in 700 ml/l concentration has a toxic effect on plants. Maximum substance concentration unable to cause biochemical processes disorder no matter how long it has had a permanent action or contact is 1000 mg/l / 11 /.

12.2 Exposure pathways on the environment

It may cause pollution of atmospheric air, soils and water bodies if regulations on handling, storage, transportation, waste management and burial are violated, or the pollution is caused by emergency (see sections 7, 12, 13).

12.3 Most Significant Description of Influence on the Environment

12.3.1 Hygienic standards
(allowable concentrations in the atmospheric air, water, including waters of fisheries, soils)

Table 2 (5, 11, 14, 16, 17, 18)

Components	Atm. air TLV or SRLI, mg/m^3 (LNV [1], class of hazard)	Water[2] TLV or SRLI, mg/l, (LNV, class of hazard)	Fish. wat.[3] TLV or SRLI., mg/l (LNV, class of hazard)	Soil TLV or APC, mg/kg (LNV)
Sodium carboxymethyl cellulose	SRLI air, one-time.=0,1	MAC water = 5,0 (general) Class of hazard 3	MAC f.w.=5,0 (san.-tox.) Class of hazard 4	No data available
Sodium chloride	One-time MAC air =0,5 (res.) class of hazard 4; Shift average MAC air=0,15 (res.) class of hazard.3	MAC air.=200 (san.-tox.Na^-), Class of hazard 2	MAC f.w.=120 (san.-tox.Na^-) Class of hazard 4	No data available

12.3.2 Ecotoxicological properties
(CL, EC, NOEC and others for fish (96 hrs), daphnia

Sodium Carboxymethyl Cellulose:
CL_{50}>500 mg/l (for fish Carassiusaartaus, 24 hours);

[1] LNV – limiting nuisance value (tox. – toxicological; san.-tox. – sanitary and toxicological; org. – organoleptic including detailed description of nature of organoleptic change in water (ord. – changes the smell of water, turb. – increases turbidity of water, col. – gives water a colour, foam – causes foam formation, foil – forms a foil on the water surface, off-fl – gives water an off-flavour, op. – results in opalescence); refl. – reflectory; res. - resorptive; refl.-res. - reflectory-resorptive, fish. - fishery (change in commercial qualities of aquatic organisms); gen. – general sanitary).
[2] Water of water objects for household, cultucal and general use
[3] Water of water objects for fisheries (including sea)

Magna (48 hrs), algae (72 or 96 hrs) etc.)	CL_0 = 192 mg/l (for daphnia Magna, 96 hours); CL_{50} = 8150 mg/l (for algae, 96 hours) / 5 /. *Sodium Chloride:* CL_{50} = 19946 mg/l (for fish Centrachlal, 24 hours); CL_{50} = 4200 mg/l (for daphnia Magna, 24 hours) / 11 /.
12.3.3 Migration and transformation in the environment through biological degradation and other processes (oxidation, hydrolyses etc.):	*Sodium Carboxymethyl Cellulose* is not degradable (biological dissimilation is less than 10%). Ultimate BOD = 0,77 mgO/dm^3; COD = 8,8 mgO/dm^3 / 5 /. *Sodium Chloride* has moderate solubility in water. Solubility is not much dependant on temperature: NaCl coefficient of solubility (in grams per 100 g of water) equals 35,9 at 21°C and 38,1 at 80°C / 11 /.

13 Recommendations on Waste (Residuals) Disposal

13.1. Safe disposal of waste formed during use, storage, transportation	Do not inhale dust. Prevent eye contact. See information on safety measures for staff in Sections 7 and 8 of the MSDS.
13.2. Data on places and methods of material waste management, emplacement and disposal, including containers and packaging material	Solid waste must be recycled or buried in specially designated areas. Water solutions must be collected, poured into authorized places and sent to a treatment plant / 1, 5 /. Packing material must not be used again; it must be discarded as industrial waste.
13.3. Recommendations on disposal of waste, that forms in household use	The material is not for household use / 1 /.

14 Information for Transport

14.1. UN number: (acc. to UN Recommendations on Transport of Dangerous Goods (standard procedures)	No UN number / 28 /.
14.2. Proper shipping name	Technical Polyanionic Cellulose, grades *PAC-LV* and *PAC-HV* / 1 /.
14.3. Used means of transport	All means of roofed transport according to shipping rules in force for this means of transport / 1, 19, 21, 22 /.
14.4. Hazard classification acc. to GOST 19433-88:	
- class	9 / 20 /.
- subclass	9.2 / 20 /.
- classification code (acc. to GOST 19433-88 when transported by railway)	921 / 20 /.
- drawing(s) of safety symbol(s)	No hazard symbols / 20 /.

14.5 Classification of dangerous goods acc. to UN Recommendations on Transport of Dangerous Goods	
- class or subclass	None / 28 /.
- extra risks	None / 28 /.
- UN packaging group	No applicable regulations for the packaging group / 28 /.
14.6. Transport marking (manipulation (handling) marks acc. to GOST 14192-96)	Transport marking – handling mark "Protect from moisture" / 23 /.
14.7. Emergency cards (if transported by railway, sea etc.)	None / 1, 9, 21, 22, 29 /.

15 Information on National and International Laws

15.1 National Law

15.1.1 Laws of the RF	Federal Law on Technical Regulation No. 184-ФЗ of 27.12.2002 Federal Law on Protection of Environment 7-ФЗ of 10.01.2002 Federal Law on Production and Consumption Wastes 89-ФЗ of 24.06.1998 Federal Law on Sanitary and Epidemiological Well-Being of the Population 52-ФЗ of 30.03.1999 Federal Law on Industrial Safety of Hazardous Production Facilities 116-ФЗ of 21.07.1997 (rev. dtd 31.07.2014)
15.1.2 Documents containing regulatory requirements on human welfare and environmental protection	not required
15.2 International conventions and agreements (if the products are subject to Montreal Protocol or Stockholm Convention)	Not controlled by Montreal Protocol or Stockholm Convention.

16 Additional Information

16.1. Data on MSDS revisions and amendments (claim «MSDS is first developed» or "MSDS was reregistered on the grounds of expiry. Previous MSDS registration number was ..." or "Amendments introduced into sections ..., date of introduction is ...")	MSDS was reregistered on the grounds of expire. Previous MSDS registration number was 50277563. 22.35180 of 31.07.2014 /37, 38 /.

16.2. List of sources of information/data used in preparation of this document[4]

1. TU 20.16.59-011-50277563-2019, Technical Polyanionic Cellulose.

2. GOST 12.1.007-88 Occupational Safety Standards System. General Sanitary Requirements for Workplace Air. – M.: Standards Publishing House, 1988.

3. GOST 31340-2013. Safety Marking of Chemical Products.

4. MAC/ TLVs of Hazardous Substances in the Working Zone Air. Hygienic Standards. ГН 2.2.5.3532-18/ ГН 2.2.5.2308-07 M: Russian Register of Hazardous Chemical and Biological Substances of the Ministry of Health of the Russian Federation, 2018/2006.

5. Information Card of Potentially Hazardous Chemical and Biological Substance. Sodium Poly-1,4-β-O-Carboxymethyl-D-Pyranosil-D-Glycopyranosa. Certificate of State Registration. Series BT No. 000303, Russian Register of Hazardous Chemical and Biological Substances, 1995.

6. Material Safety Data Sheet 0006912. Chemically Pure Sodium Carboxymethyl Cellulose. Lamberti spa, Italy. Translation from Russian.

7. V.O. Sheftel. Hazardous Substances in Plastics. Reference Book. – M.: Khimia, 1991.

8. Fire and Explosion Safety of Substances and Materials and Agents for Their Extinguishing. Reference Guide. A.J. Korolchenko. – M.: Pozhnauka Association, 2004. book 2. page 744

9. GOST 12.1.004-2018. Fire Safety. General Requirements.

10. Chemistry Encyclopedia. Under the editorship of I.L. Knuniants. – M.: Soviet Encyclopedia, 1990. book 2, p. 633

11. Information Card of Potentially Hazardous Chemical and Biological Substance. Sodium Chloride. Certificate of State Registration No. AT-000435, Russian Register of Hazardous Chemical and Biological Substances, 1995.

12. Toxicity Mode of Inorganic Compounds. Ju. A. Ershov. – M.: Khimia, 1971.

13. Hazardous Chemical Substances In Industry. Reference Book for Chemists, Engineers and Physicians. 7th edition, in three volumes / under the editorship of N.V. Lazarev and E.N. Levina. – L.: Khimia, 1976.

14. Water Quality Standards for Water Bodies for Fisheries, Including Norms of Hazardous Substances Threshold Limit Values (TLVs) in Water of Water Bodies for Fisheries, approved by administrative order No. 522 of Ministry of Agriculture dated 13.12.2016.

15. Ja.M. Grushko. Hazardous Inorganic Compounds in Industrial Wastewaters. Reference Book. – L: Khimia, 1979.

16. GOST 12.1.005-88. Occupational Safety Standards System. General Sanitary Requirements for Working Zone Air (with amendment N 1).

[4] Item numbers of sources of data are given in each MSDS clause as references

17. MAC/TLVs in Atmospheric Air of Communities: ГН 2.1.6.3492-17/2.1.6.2309-07. Hygienic Standards. – M.: Ministry of Health of the RF, 2018 and 2016.

18. MAC/TLVs of Chemical Substances in Water of Water Bodies of Municipal and Amenity Water Use. ГН 2.1.5.1315-03/2.1.5.2307-07. Hygienic Standards. – M.: Ministry of Health of the RF, 2017 and 2013

19. Agreement on International Goods Transport by Rail (with amendments as on 01.07.2017).

20. GOST 19433-88 Dangerous Goods. Classification and Marking (approved by Decision of RosStandart of the USSR No. 2957 of 19.08.1988) (edition of 01.09.1992).

21. Regulations for Transport of Dangerous Goods by Road, approved by Decision of the Government of the RF No. 272 dated 15.04.2011 (edition of 12.12.2017, with amendments of 22.12.2018). On Approval of Regulations for Transport of Goods by Road.

22. European Agreement concerning International Carriage of Dangerous Goods by Road (ADR), 2019.

23. GOST 14192-96. Interstate Standard. Goods Marking (effective by Decision of GosStandart of the RF No. 219 of 18.06.1997).

24. GOST 32419-2013. Interstate Standard. Classification of Dangerous Chemical Products. General Requirements.

25. GOST 32423-2013. Interstate Standard. Hazard Classification for Mixtures of Chemical Products by Impact on Human Body.

26. GOST 32425-2013. Interstate Standard. Hazard Classification for Mixtures of Chemical Products by Impact on the Environment.

27. GOST 31340-2013. Interstate Standard. Safety Marking. General Requirements.

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