Safety data sheet according to U.S.A. Federal Hazcom 2012 and Canadian Regulation SOR/88-66

SECTION 1. Identification of the substance/mixture and of the company/undertaking.

1.1. Product identifier.

Code.	**HI7090**
Product name.	**ISA for Sodium ISE**

1.2. Relevant identified uses of the substance or mixture and uses advised against.

Intended use.	**Ionic Strength Adjuster (ISA) for Sodium Ion Selective Electrodes.**

1.3. Details of the supplier of the safety data sheet.

Name.	**Hanna Instruments S.R.L.**
Full address.	**str. Hanna Nr 1**
District and Country.	**457260 loc. Nusfalau (Salaj)** **Romania** **Tel. (+40) 260607700** **Fax. (+40) 260607700**
e-mail address of the competent person. responsible for the Safety Data Sheet.	**sds@hannainst.com**
Product distribution by:	**Hanna Intruments, Inc - 584 Park East, Woonsochet, Rhode Island, USA 02895 - Technical Service Contact Information: +1-800-426-6287**

1.4. Emergency telephone number.

For urgent inquiries refer to.	**USA Emergency Contact Information: +1-800-424-9300 - CHEMTREC 24 hours/365 days - International Emergency Contact Information: +1-703-527-3887 - CHEMTREC 24hours/365 days**

SECTION 2. Hazards identification.

2.1. Classification of the substance or mixture.

The product is classified as hazardous pursuant to the provisions set forth in OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200). The product thus requires a safety datasheet.
Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Classification and Hazard Statement.

Substance or mixture corrosive to metals, category 1	May be corrosive to metals.
Skin corrosion, category 1B	Causes severe skin burns and eye damage.
Serious eye damage, category 1	Causes serious eye damage.
Specific target organ toxicity - single exposure, category 3	May cause respiratory irritation.

Hazard pictograms:

Signal words: Danger

Hazard statements:

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.

Precautionary statements:
Prevention:

P261	Avoid breathing dust, fume, gas, mist, vapours, spray.
P280	Wear protective gloves, protective clothing, eye protection and face protection.

SECTION 2. Hazards identification. ... / >>

Response:

P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water / shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor.

Storage:

P404	Store in a closed container.

Disposal:

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2.2. Other hazards.

Information not available.

SECTION 3. Composition/information on ingredients.

3.1. Substances.

Information not relevant.

3.2. Mixtures.

Contains:

Identification.	**x = Conc. %.**	**Classification:**
AMMONIUM CHLORIDE		
CAS. 12125-02-9	10 ≤ x < 30	Acute toxicity, category 4 H302, Eye irritation, category 2 H319
EC. 235-186-4		
INDEX. 017-014-00-8		
Reg. no. 01-2119487950-27		
AMMONIUM HYDROXIDE		
CAS. 1336-21-6	5 ≤ x < 9	Substance or mixture corrosive to metals, category 1 H290, Skin corrosion, category 1B H314, Specific target organ toxicity - single exposure, category 3 H335, Hazardous to the aquatic environment, acute toxicity, category 1 H400 M=1
EC. 215-647-6		
INDEX. 007-001-01-2		

* There is a batch to batch variation.

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures.

4.1. Description of first aid measures.

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 30-60 minutes, opening the eyelids fully. Get medical advice/attention.

SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention.

INGESTION: Have the subject drink as much water as possible. Get medical advice/attention. Do not induce vomiting unless explicitly authorised by a doctor.

INHALATION: Get medical advice/attention immediately. Remove victim to fresh air, away from the accident scene. If the subject stops breathing, administer artificial respiration. Take suitable precautions for rescue workers.

4.2. Most important symptoms and effects, both acute and delayed.

Specific information on symptoms and effects caused by the product are unknown.

For symptoms and effects caused by the contained substances, see chap. 11.

AMMONIUM HYDROXIDE

AMMONIUM HYDROXIDE 32%: Irritation and corrosion, bronchitis, Cough, Shortness of breath, gastric pain, Unconsciousness, Bloody vomiting, Nausea, collapse, shock, Risk of blindness!.

4.3. Indication of any immediate medical attention and special treatment needed.

Information not available.

SECTION 5. Firefighting measures.

5.1. Extinguishing media.

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture.

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters.

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures.

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions.

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up.

Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections.

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage.

7.1. Precautions for safe handling.

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities.

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed.

Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s).

Information not available.

SECTION 8. Exposure controls/personal protection.

8.1. Control parameters.

Regulatory References:

USA	NIOSH-REL	NIOSH publication No. 2005-149, 3th printing, 2007.
USA	CAL/OSHA-PEL	California Division of Occupational Safety and Health (Cal-OSHA) Permissible Exposure Limits (PELs).
EU	OEL EU	Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC.
	TLV-ACGIH	ACGIH 2016

AMMONIUM CHLORIDE

Threshold Limit Value.

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
TLV-ACGIH	-	10		20	
CAL/OSHA	USA	10		20	
NIOSH	USA	10		20	

AMMONIUM HYDROXIDE

Threshold Limit Value.

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
OEL	EU	14	20		
TLV-ACGIH	-	17	25	24	35

Legend:
(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

8.2. Exposure controls.

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration. Personal protective equipment must comply with current regulations.
HAND PROTECTION
Protect hands with category III work gloves (OSHA 29 CFR 1910.138).
The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.
The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.
SKIN PROTECTION
Wear category I professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.
EYE PROTECTION
Wear airtight protective goggles (OSHA 29 CFR 1910.133).
RESPIRATORY PROTECTION
If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, wear a mask with a NIOSH certified filter, whose class must be chosen according to the limit of use concentration (NIOSH 42 CFR 84, OSHA 29 CFR 1910.134). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.
Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.
If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus or external air-intake breathing apparatus. For a correct choice of respiratory protection device, see standard NIOSH 42 CFR 84 and OSHA 29 CFR 1910.134.
ENVIRONMENTAL EXPOSURE CONTROLS.
The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties.

Appearance	liquid
Colour	colourless
Odour	amino

SECTION 9. Physical and chemical properties. ... / >>

Odour threshold.		Not available.	
pH.		9.6	
Melting point / freezing point.		Not available.	
Initial boiling point.		Not available.	
Boiling range.		Not available.	
Flash point.	>	93 °C.	(199,4 °F)
Evaporation rate		Not available.	
Flammability (solid, gas)		Not available.	
Lower inflammability limit.		Not available.	
Upper inflammability limit.		Not available.	
Lower explosive limit.		Not available.	
Upper explosive limit.		Not available.	
Vapour pressure.		Not available.	
Vapour density		Not available.	
Relative density.		1.000	
Solubility		soluble in water	
Partition coefficient: n-octanol/water		Not available.	
Auto-ignition temperature.		Not available.	
Decomposition temperature.		Not available.	
Viscosity		Not available.	
Explosive properties		Not available.	
Oxidising properties		Not available.	

9.2. Other information.

Total solids (250°C / 482°F)	21,10 %

SECTION 10. Stability and reactivity.

10.1. Reactivity.

There are no particular risks of reaction with other substances in normal conditions of use.

AMMONIUM HYDROXIDE
AMMONIUM HYDROXIDE 32%: corrodes aluminium, iron, zinc, copper and their alloys.

10.2. Chemical stability.

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions.

No hazardous reactions are foreseeable in normal conditions of use and storage.

AMMONIUM HYDROXIDE
AMMONIUM HYDROXIDE 32%: Risk of explosion on contact with strong acids and iodine. Can react dangerously with strong bases.

10.4. Conditions to avoid.

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials.

AMMONIUM HYDROXIDE
AMMONIUM HYDROXIDE 32%: Silver, lead, zinc and their salts; hydrochloric acid, nitric acid, oleum, halogens, acrolein, nitromethane and acrylic acid.

10.6. Hazardous decomposition products.

AMMONIUM HYDROXIDE
AMMONIUM HYDROXIDE 32%: Nitric oxides.

SECTION 11. Toxicological information.

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

SECTION 11. Toxicological information. ... / >>

11.1. Information on toxicological effects.

AMMONIUM HYDROXIDE

AMMONIA 32% - Skin irritation rabbit, Result: Severe irritations, (29% solution), Dermatitis Necrosis, Mixture causes burns - Eye irritation rabbit, Result: Severe irritations, (29% solution), Mixture causes serious eye damage. Risk of blindness!

ACUTE TOXICITY.

LC50 (Inhalation - vapours) of the mixture:	Not classified (no significant component).
LC50 (Inhalation - mists / powders) of the mixture:	Not classified (no significant component).
LD50 (Oral) of the mixture:	4700,000 mg/kg
LD50 (Dermal) of the mixture:	Not classified (no significant component).

AMMONIUM CHLORIDE

LD50 (Oral).	1410 mg/kg Rat

AMMONIUM HYDROXIDE

LD50 (Oral).	350 mg/kg Rat

SKIN CORROSION / IRRITATION.
Corrosive for the skin.

SERIOUS EYE DAMAGE / IRRITATION.
Causes serious eye damage.

RESPIRATORY OR SKIN SENSITISATION.
Does not meet the classification criteria for this hazard class.

GERM CELL MUTAGENICITY.
Does not meet the classification criteria for this hazard class.

CARCINOGENICITY.
Does not meet the classification criteria for this hazard class.

REPRODUCTIVE TOXICITY.
Does not meet the classification criteria for this hazard class.

STOT - SINGLE EXPOSURE.
May cause respiratory irritation.

STOT - REPEATED EXPOSURE.
Does not meet the classification criteria for this hazard class.

ASPIRATION HAZARD.
Does not meet the classification criteria for this hazard class.

SECTION 12. Ecological information.

No specific data are available for this product. Handle it according to good working practices. Avoid littering. Do not contaminate soil and waterways. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation. Please take all the proper measures to reduce harmful effects on aquifers.

12.1. Toxicity.

AMMONIUM CHLORIDE

LC50 - for Fish.	3.98 mg/l/96h Oncorhynchus mykiss
EC50 - for Crustacea.	> 100 mg/l/48h Daphnia magna
LC10 for Fish.	4.28 mg/l/28d Lepomis macrochirus
Chronic NOEC for Fish.	57 mg/l Oncorhynchus mykiss

AMMONIUM HYDROXIDE

LC50 - for Fish.	0.53 mg/l/96h Oncorhynchus mykiss
EC50 - for Crustacea.	20 mg/l/48h Daphnia magna

12.2. Persistence and degradability.

SECTION 12. Ecological information. ... / >>

AMMONIUM CHLORIDE
Solubility in water. > 10000 mg/l
Biodegradability: Information not available.

AMMONIUM HYDROXIDE
Biodegradability: Information not available.

12.3. Bioaccumulative potential.

AMMONIUM CHLORIDE
Partition coefficient: n-octanol/water. -3.2 Log Kow

AMMONIUM HYDROXIDE
Partition coefficient: n-octanol/water. -1.38 Log Kow

12.4. Mobility in soil.
Information not available.

12.5. Results of PBT and vPvB assessment.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects.
AMMONIUM HYDROXIDE
AMMONIUM HYDROXIDE 32%: Biological effects: Harmful effect due to pH shift. Forms toxic mixtures in water, dilution measures notwithstanding. Further information on ecology Discharge into the environment must be avoide.

SECTION 13. Disposal considerations.

13.1. Waste treatment methods.
Reuse, when possible. Neat product residues should be considered special non-hazardous waste.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
Waste transportation may be subject to dangerous goods transport regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information.

14.1. UN number.

ADR / RID, IMDG, IATA: 2672

14.2. UN proper shipping name.

ADR / RID: AMMONIA SOLUTION
IMDG: AMMONIA SOLUTION
IATA: AMMONIA SOLUTION

14.3. Transport hazard class(es).

ADR / RID: Class: 8 Label: 8

IMDG: Class: 8 Label: 8

IATA: Class: 8 Label: 8

14.4. Packing group.

ADR / RID, IMDG, IATA: III

SECTION 14. Transport information. ... / >>

14.5. Environmental hazards.

ADR / RID:	NO
IMDG:	NO
IATA:	NO

14.6. Special precautions for user.

ADR / RID:	HIN - Kemler: 80 Special Provision: -	Limited Quantities: 5 L	Tunnel restriction code: (E)
IMDG:	EMS: F-A, S-B	Limited Quantities: 5 L	
IATA:	Cargo: Pass.: Special Instructions:	Maximum quantity: 60 L Maximum quantity: 5 L A64, A803	Packaging instructions: 856 Packaging instructions: 852

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code.

Information not relevant.

SECTION 15. Regulatory information.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

U.S. Federal Regulations.

TSCA:
All components are listed on TSCA Inventory.

Clean Air Act Section 112(b):
No component(s) listed.

Clean Air Act Section 602 Class I Substances:
No component(s) listed.

Clean Air Act Section 602 Class II Substances:
No component(s) listed.

Clean Water Act – Priority Pollutants:
No component(s) listed.

Clean Water Act – Toxic Pollutants:
No component(s) listed.

DEA List I Chemicals (Precursor Chemicals):
No component(s) listed.

DEA List II Chemicals (Essential Chemicals):
No component(s) listed.

EPA List of Lists:
313 Category Code:
1336-21-6 AMMONIUM HYDROXIDE

EPCRA 302 EHS TPQ:
No component(s) listed.

EPCRA 304 EHS RQ:
No component(s) listed.

CERCLA RQ:
12125-02-9 AMMONIUM CHLORIDE
1336-21-6 AMMONIUM HYDROXIDE

EPCRA 313 TRI:
1336-21-6 AMMONIUM HYDROXIDE

SECTION 15. Regulatory information. ... / >>

RCRA Code:
No component(s) listed.

CAA 112 (r) RMP TQ:
No component(s) listed.

State Regulations.

Massachussetts:

12125-02-9	AMMONIUM CHLORIDE
1336-21-6	AMMONIUM HYDROXIDE

Minnesota:

12125-02-9	AMMONIUM CHLORIDE

New Jersey:

12125-02-9	AMMONIUM CHLORIDE
1336-21-6	AMMONIUM HYDROXIDE

New York:

12125-02-9	AMMONIUM CHLORIDE
1336-21-6	AMMONIUM HYDROXIDE

Pennsylvania:

12125-02-9	AMMONIUM CHLORIDE
1336-21-6	AMMONIUM HYDROXIDE

California:

12125-02-9	AMMONIUM CHLORIDE
1336-21-6	AMMONIUM HYDROXIDE

Proposition 65:
This product does not contain any substances know to the State of California to cause cancer, reproductive harm or birth defects.

International Regulations.
Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None.

Substances subject to the Rotterdam Convention:
None.

Substances subject to the Stockholm Convention:
None.

Candadian WHMIS.
Information not available.

SECTION 16. Other information.

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Met. Corr. 1	Substance or mixture corrosive to metals, category 1
Acute Tox. 4	Acute toxicity, category 4
Skin Corr. 1B	Skin corrosion, category 1B
Eye Dam. 1	Serious eye damage, category 1
Eye Irrit. 2	Eye irritation, category 2
STOT SE 3	Specific target organ toxicity - single exposure, category 3
Aquatic Acute 1	Hazardous to the aquatic environment, acute toxicity, category 1
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.

LEGEND:
- 313 CATEGORY CODE: Emergency Planning and Community Right-to Know Act Section 313 Category Code

SECTION 16. Other information. ... / >>

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAA 112 ® RMP TQ: Risk Management Plan Threshold Quantity (Clean Air Act Section 112®)
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CERCLA RQ: Reportable Quantity (Comprehensive Environment Response, Compensation, and Liability Act)
- CLP: EC Regulation 1272/2008
- DEA: Drug Enforcement Administration
- EmS: Emergency Schedule
- EPA: US Environmental Protection Agency
- EPCRA: Emergency Planning and Community Right-to Know Act
- EPCRA 302 EHS TPQ: Extremely Hazardous Substance Threshold Planning Quantity (Section 302 Category Code)
- EPCRA 304 EHS RQ: Extremely Hazardous Substance Reportable Quantity (Section 304 Category Code)
- EPCRA 313 TRI: Toxics Release Inventory (Section 313 Category Code)
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PEL: Predicted exposure level
- RCRA Code: Resource Conservation and Recovery Act Code
- REL: Recommended exposure limit
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TSCA: Toxic Substances Control Act
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- WHMIS: Workplace Hazardous Materials Information System.

GENERAL BIBLIOGRAPHY:

- GHS rev. 3
- The Merck Index. 10th Edition
- Handling Chemical Safety
- Niosh - Registry of Toxic Effects of Chemical Substances
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website

- 6 NYCRR part 597
- Cal/OSHA website
- California Safe Drinking Water and Toxic Enforcement Act
- EPA website
- Hazard Comunication Standard (HCS 2012)
- IARC website
- List Of Lists EPA: Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112® of the Clean Air Act
- Massachussetts 105 CMR Department of public health 670.000: "Right to Know"
- Minensota Chapter 5206 Departemnt Of Labor and Industry Hazardous Substances, Employee "Right to Know".
- New Jersey Worker and Community Right to know Act N.J.S.A.
- NTP. 2011. Report on Carcinogens, 12th Edition.
- OSHA website
- Pennsylvania, Hazardous Substance List, Chapter 323

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

SECTION 16. Other information. ... / >>

Provide appointed staff with adequate training on how to use chemical products.