International Hazard Datasheets on Occupation

Detergent and disinfectant manufacturing worker

Who are detergent and disinfectant manufacturing workers?

They are industrial chemists who tend equipment units and semiautomatic systems that process chemical substances into industrial or consumption products, such as detergents, disinfectants, bleaching agents and soaps etc.

What is dangerous about this job?

- Hazard of explosion due to high concentrations of fine dust (detergents, raw materials) in air
- Accidental exposure to toxic substances, due to scattering of substances as a result of spill, outburst due to high-pressure, explosions, splashes, etc. and due to human error, particularly in the manufacturing of disinfectants
- Exposure to dust of detergents and raw materials (phosphates, sulfates and other substances) during the manufacturing of detergents (mixing, drying, packaging) may affect the respiratory tract and cause irritation of the skin and the eyes
- Exposure to harmful toxic substances (esp. in disinfectant manufacturing) the effect of which depend on the type of disinfectant
- Exposure to dust containing enzymes during the manufacturing of detergents may cause skin irritation and allergic reactions of the respiratory tract; exposure to high levels of this dust can cause asthma.
- Exposure to odours in detergent and disinfectant manufacturing may cause specific sensitivity to these odours as well as nausea.

Hazards related to this job

Specific preventive measures can be seen by clicking on the respective in the third column of the table.

Accident hazards	• Slip on floors made wet and slippery due to leaks from pipes and other installations	1
	• Injuries caused by falling packs of detergents (dry and liquid) during transportation	
	• Mechanical injuries during work with conveyors and with mechanized equipment used for the mixing and/or feeding of chemicals	
	• Hazard of explosion due to high concentrations of fine dusts (detergents, raw materials) in the air	2
	• Electrocution caused by the use of defective electrical equipment and installations	3
	• Burns and scorching caused by contact with extremely hot surfaces, hot water	

	and leaking steam	
	• Accidental exposure to toxic substances, scattered as a result of spilling and outbursts caused by overpressure, explosion, splashing, or human error, esp. in manufacturing of disinfectants	
	• Injuries and fractures (including hernia), due to strenuous movements during lifting, pulling and pushing	4
Physical hazards	• High levels of humidity and temperature may cause fatigue and thermal exhaustion	2
	• Exposure to high noise levels created in the process of feeding raw materials and/or mixing	5
Chemical hazards	• Exposure to dust of detergents and of raw materials (phosphates, sulfates and other substances) during the manufacturing of detergents (mixing, drying, packaging) may cause problems in the respiratory tract and irritation of the skin and the eyes	2 6
	• Exposure to VOC (hexane, 1, 1, 1-trichloro-methyl-alcohol, benzene, etc.) formed throughout the preparation of surfactants	6
	• Exposure to disinfectants: disinfectants are toxic substances intended to kill organisms and may endanger humans as well. Before choosing any disinfectant, it is important to know what organisms they are intended against. Typically, these organisms may be viruses, bacteria, spores and fungi. There are different classes of disinfectants, based on the type of agents they contain (see appendix 1)	7
Biological hazards	• Exposure to dust containing enzymes, may cause skin irritation and allergic reactions of the respiratory tract; exposure to high levels of this dust can cause asthma	8
Ergonomic, psychosocial and organizational factors	• Back pains and other musculoskeletal problems caused by overexertion and awkward postures during lifting and moving of detergent packs and other heavy loads	4
	• Cumulative trauma disorders (CTD) as a result of continuous repetitive work movements particularly in packaging	
	• Exposure to odours in detergent and disinfectant manufacturing may cause specific sensitivity to the odours and/or feeling of nausea	2

Preventive measures

1 Wear safety shoes with non-skid soles.

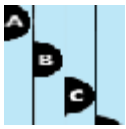
2. Install effective exhaust ventilation and air conditioning to prevent air contamination, bad odors, and heat stress; in specific situations it is recommended to use odor neutralizers.
3. Check periodically the electrical equipment for safety and call a qualified electrician for testing and repair of faulty or suspect electrical equipment.
4. Use safe lifting and moving techniques for heavy or awkward loads; use mechanical aids to assist in lifting.
5. Use appropriate ear protection; consult a safety supervisor or a supplier
6. Wear a respirator to avoid inhalation of dust or aerosols
7. Apply chemical safety rules when handling or working with hazardous chemicals; read MSDS and consult a safety supervisor regarding specific chemicals.
8. Ask for medical aid, if skin rash develops; consult an allergy specialist on how to deal with the problem.

Specialized information

Synonyms

Analytical anorganic chemist; analytical organic chemist; chemist.

Definitions and/or description



Conducts analysis, synthesis, and experimentation on substances, for such purposes as product and process development and application, quantitative and qualitative analysis, and improvement of analytical methodologies: Analyzes the chemical nature and make-up of substances using a variety of modern analytical techniques, methods and high technology instrumentation. Analyzes organic and inorganic compounds to determine chemical and physical properties, utilizing such techniques as chromatography, spectroscopy, and spectrophotometry. Conduct sample preparation and quantitative analysis of air, water, and soil samples; work with samples containing toxic and hazardous materials. May be responsible for, challenge, calibration, maintenance, and operation of automatic instrumentation and samples systems. Conducts research into composition, structure, properties, relationships, and reactions of matter. An analytical chemist must know the tools that are available to tackle a wide variety of problems. Must have strong skills, practical experience, and understanding of various analytical techniques used in the design, development, identification and characterization of novel compounds. Must have ability to work independently and effectively under deadlines. May be designated according to chemistry specialty as analytical Inorganic Chemist; Analytical Organic Chemist.

Related and specific occupations

Chemical technician; organic chemist; inorganic chemist; chemical laboratory worker; chemical engineer; physical chemist; chemical laboratory technician.

Tasks

Adding; adjusting; analyzing; applying; assembling; blending; boiling; calculating; calibrating; changing; classifying; cleaning; closing; concluding; conferring; confirming; connecting; controlling; cooling; contacting (customers); counting; cutting; decreasing; delivering; demonstrating; determining; developing; diluting; disinfecting; dissolving; distributing; ; dosing; dropping; drying; entering of data; estimating; evaporating; examining; extinguishing; fermenting; filling; filtering; grinding; heating; identifying; injecting; installing; making (holes); managing; marking; measuring; milling; mixing; moving; observing; operating; opening; ordering; participating; performing; preparing; printing; processing; refining; removing; reporting; researching; sampling; searching; selecting; separating; sorting; spilling; sterilizing; storing (sample); strengthening; supervising; supplying; taking; treating; updating; warning; washing; weighing; writing.

Primary equipment used

Adjustment and measure temperature equipment; analysis and sampling equipment; balance weight; blending and mixing tools; calculator; computer; electric equipment; glass and plastic vessels; graphic monitor; filters; laboratorial bottles; measure instrument; personal protective equipment; protection and treatment devices; pumps; sieve; scales; stopwatch; vacuum pump.

Workplaces where the occupation is common

Clinics; hospitals; public and private laboratory; industries: chemistry, food, metal finishing, metallurgy, paper, petrochemistry, polymer, rubber, and another; quality assurance laboratory; standard institute; schools; university.

Notes

1. Analytical chemistry is the science of the measurement and identification of the chemical compounds that underlie most aspects of modern life and plays a central part within the chemical industry.

2. Analytical chemists determine the quality of drugs, ensure the accuracy of the testing of the toxicity and stability of pharmaceuticals, and determine the composition of everything edible from cat food to best steak, the quality of steel in a suspension bridge, and the composition of moon dust. Analytical chemistry is the basis of forensic chemistry, the testing of drugs in sport, the identification of contaminants in food, the measurement of environmental quality and pollution, whether of air, soil, or water, and numerous other measurements. Analytical chemists identify the constituents of industrial waste, trace the spillage of pollutants, identify drugs at the scene of a crime, and trace a car from the fragments left at an accident. Their work has lead to home-testing kits for pregnancy and diabetes, curbside testing of blood alcohol levels of drunk drivers, checking the pH of soils, monitoring lead and carbon dioxide levels in exhausts, ensuring the purity of the water you drink and many others.

3. In the light of aforesaid it is clear, that exposure of workers to occupational hazards is highly dependent on their occupation. Therefore, it is possible to provide in more details concerning occupational hazards once their exact occupation is known.

References

1. ILO Encyclopaedia of Occupational Health and Safety, 3rd Ed., Geneva, 1983.

2. ILO Encyclopaedia of Occupational Health and Safety, 4th Ed., Geneva, 1998.

3. Kirk-Othmer, Encyclopedia of Chemical Technology, 4th Ed., 1992.

4. U.S. Department of Labor: Dictionary of Occupational Titles – DOT, 2 Vol., 1991.

Appendix 1: Disinfectants

Disinfectant Classes	Common Examples
Bases Hydroxides	Sodium hydroxide, caustic soda, soda lye, calcium oxide (lime)
Biguanides Chlorhexidine	Nolvasan®, Virosan, ChlorhexiDerm
Cationic Surfactants Quaternary Ammonium Compounds (QAC)	Parvosol™, Roccal-D® Plus, A33™, Maxima 128, Ken-Care, Unicide 256, benzalkonium chloride, bensathonium chloride, cetylpyridinium chloride
Halogens and Halogen-containing Compounds	Sodium hypochlorite (chlorine bleach), Alcide, Sodium dichloroisocyanurate, calcium hypochlorite, organic chlorides (chlorine weakly bonded to nitrogen)

Chlorine-based	
Iodine-based	Iodine, iodophors, povidone-iodine, Betadine
Oxidizing Agents Peroxides	Hydrogen peroxide, Sodium perborate, Benzoyl peroxide, Potassium permanganate
Peroxygen Compounds	Stabilized chlorine dioxide, oxyfresh Dent-A-Gene, Virkon® S
Phenols and Related Compounds Phenolics	Phenol (carbolic acid), Cresol (cresylic acid), Lysol, Pine Tar, Pine Oil
Synthetic phenols	Chloroxylenols, hexachlorophene, sporicidin, parachlorometaxylenol (PCMX), Dichlorometaxylenol (DCMX)
Reducing Agents Aldehydes	Glutaral (Glutaraldehyde), formalin (Formaldehyde), DC&R, Johnson & Johnson CIDEX DISINFECTANT, WAVICIDE®-01

This datasheet was authored by a group of experts headed by prof. Donagi from the Israel Institute for Occupational Safety and Hygiene

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Updated by VM. Approved by AS. Last update: 20.04.2009.