Safety Practices

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AB SCIEX

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Safety Practices

General Information

Before you operate any instrument, you should read, understand, and follow all safety precautions to prevent personal injury or damage to the instrument. Warnings and labels on the instrument are shown with international symbols.

These safety practices are intended to supplement your federal, state or provincial, and local health and safety regulations and laws. The information provided covers instrument-related safety with regard to the operation of the instrument. It does not cover every safety procedure that should be practised. Ultimately, you and your organization are responsible for compliance with federal, state, provincial, and local EHS legal requirements and for maintaining a safe laboratory environment. For additional information, refer to the *Chemical Rubber Company Handbook of Laboratory Safety* and *Prudent Practices for Handling Chemicals in Laboratories*.

Symbols and Conventions

The following conventions are used throughout all the manuals:

DANGER! Danger signifies an action which may lead to severe injury or death.

WARNING! A warning indicates an operation that could cause personal injury or damage to property if precautions are not followed.

CAUTION! A caution indicates an operation that could cause damage to the instrument if precautions are not followed.

Regulatory Compliance

This instrument, and its components, meet or exceed the requirements of the following regulations. Applicable labels for these certifications have been affixed to the instrument.

US Federal Communications Commission

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the Federal Communications Commission Compliance (FCC) Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the operator's manual, can cause harmful interference to radio communications. Operation of

this equipment in a residential area is likely to cause harmful interference in which case you will be required to correct the interference, at your own expense. Changes or modifications not expressly approved by the manufacturer could void your authority to operate the equipment.

International Standards

AB SCIEX instruments are in compliance with the following standards:

Europe

- Electromagnetic Compatibility: EN 61326-1; EN 55011-Class A
- Safety: EN 61010-1; EN 61010-2-061; EN 61010-2-081
- Laser safety: EN 60825-1

International

- Electromagnetic Compatibility: IEC 61326-1; CISPR11 (Class A)
- Safety: IEC 61010-1; IEC 61010-2-061; IEC 61010-2-081
- Laser safety: IEC 60825-1

Canada and USA

- CAN/CSA C22.2 No. 61010-1, CAN/CSA C22.2 No. 61010-1-2-061, CAN/CSA C22.2 No. 61010-1-2-081
- Industry Canada ICES-001
- UL 610101-1
- FDA/CDRH 1040.10; 1040.11

For more information, refer to the Declaration of Conformance included with the instrument.

European Union Directives

AB SCIEX instruments are in compliance with the following directives:

- EMC: Electromagnetic Compatibility Directive 89/336/EEC and 93/68/EEC or 2004/108/EC
- Safety: Low Voltage Directives 72/23/EEC and 93/68/EEC or 2006/95/EC
- WEEE: Waste, Electrical, and Electronic Equipment Directive 2002/96/EEC

The Declaration of Conformance is included with the instrument.

WEEE Compliance

Do not dispose of system components or subassemblies, including computer parts, as unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of WEEE (waste, electrical, and electronic equipment). To make sure that you safely dispose of this equipment, contact your FSE (Field Service Employee) for instructions. European Union customers: Contact your local AB SCIEX Customer Service office for complimentary equipment pick-up and recycling.

Safety Signs and Symbols

The instrument has been designed with safety features, including interlocks, to prevent access to high-voltage areas and to minimize the possibility of injury due to electric shock, fire, or contact with moving parts. The following safety symbols can be found on the instrument. Not every instrument has all the safety symbols.

Table 1-1 Electrical Hazard Warning and Safety Symbols on Instruments

Safety Symbol	Reference	Description
	IEC 60417-5036	Caution, risk of electric shock
	IEC 60417-5041	Caution, hot surface
	ISO 7000-0434B	Caution, refer to accompanying documents
	IEC 60417-5152	Caution, Radiation of laser apparatus
	EU Directive 2002/96/EEC	Do not dispose of equipment as unsorted municipal waste
	IEC 60417-5007	On (Mains supply)
	IEC 60417-5008	Off (Mains supply)
	IEC 60417-5019	Protective earth (ground)
	IEC 60417-5032	Alternating current
	ISO 7000-1641	Operator's Guide
	IEC 60878	Follow operating instructions (mandatory)

Table 1-1 Electrical Hazard Warning and Safety Symbols on Instruments

Safety Symbol	Reference	Description
Hz	—	Hertz (frequency)
A	—	Amp (current)
W	—	Watt (power)
V	—	Volt (voltage)

Table 1-2 Hazard, Warning, and Safety Symbols

Safety Symbol	Description
	Corrosive materials
	Biohazard
	Heavy object
	Piercing Hazard
	Crushing Hazard
	Explosion hazard
	Toxic hazard
	Fire hazard
	Pressurized gas hazard

Qualified Personnel

Only qualified persons familiar with the operation of the instrument and the hazards involved are permitted to operate, clean, or service the instrument. Contact your AB SCIEX representative for available training courses.

Identifying Qualified Personnel

Customers who have completed the Maintenance Training with the CSR are considered qualified to perform specific maintenance procedures.

Customers who have completed the Customer Familiarization Checklist with the CSR are qualified to operate the instrument. Customers do not have to complete the qualified personnel training in order to operate the instrument.

Training of Qualified Personnel

The CSR uses the customer maintenance document to train the customer on maintenance procedures during the installation of the instrument. After completing the training, the customer can perform specific maintenance procedures on the instrument.

After installing the system, the CSR uses the Customer Familiarization Checklist to train the customer on how to use the system. The CSR updates the Customer Familiarization Checklist and the customer signs it after training is completed.

Personal Protection Equipment

Only qualified personnel familiar with the operation of the instrument and the hazards involved are permitted to operate, clean, or service the instrument. Wear protective clothing, including gloves, safety eyewear, and a lab coat, when operating the instrument. Anyone operating the instrument should review the standard laboratory procedures as described in the following documents:

- Chemical Rubber Company Handbook of Laboratory Safety
- Prudent Practices for Handling Hazardous Chemicals in Laboratories
- The instrument operator's manual and site planning guide for the instrument

Make sure that appropriate PPE (personal protective equipment) is worn at all times when hazardous materials are used. All PPE must be kept in good repair.

Wear appropriate eye protection at all times when handling chemicals. Use safety glasses with side shields, goggles, or full-face shields, depending on the types of chemicals you will be handling.

WARNING! Corrosive Materials: Chemicals used with the instrument may be corrosive. Wear suitable protective clothing, including gloves specifically resistant to the chemicals being handled.

Equipment Modification

If the instrument is used in a manner not specified by the manufacturer, the protection provided by the equipment can be impaired.

WARNING! Any unauthorized modification or operation of the instrument may cause personal injury and equipment damage, and may void the warranty. Do not modify the equipment.

Handling the Instrument

Check the weight of the system in the site planning guide for the instrument. Always obtain help when moving heavy equipment. Turn off all gas and power sources before disconnecting them from the instrument. If you are relocating the instrument to a different site, contact your FSE.

WARNING! Physical Injury Hazard: Do not block the mains switch. Potential risk of personal injury or equipment damage if the instrument cannot be turned off in an emergency. Position the instrument so the mains switch can be easily accessed.

WARNING! Physical Injury Hazard: The instrument is to be moved and positioned only by the personnel or vendor specified in the applicable site preparation guide. If you decide to move the instrument after it has been installed, shut down the instrument. Do not attempt to move the instrument without the assistance of others, the use of appropriate moving equipment, and proper lifting techniques. Improper lifting can cause painful and permanent back injury. Depending on the weight, moving or lifting an instrument may require at least six people.

WARNING! Physical Injury Hazard: Take care when handling syringes. Syringes are thin. Careless handling could result in skin punctures or syringe damage.

WARNING! Physical Injury Hazard: Moving parts can crush and cut. Keep hands clear of moving parts while operating the instrument. Disconnect power before servicing the instrument.

Laboratory Ventilation

The venting of fumes and disposal of waste must be in accordance with all federal, state, provincial, and local health and safety regulations and laws. The instrument shall be used indoors in a laboratory that complies with the environmental conditions recommended in the site planning guide for the instrument. The source exhaust system must be vented either to an external fume hood or to an external exhaust source as recommended in the site planning guide for the instrument.

Environmental Conditions

Use qualified personnel for the installation of mains, electrical, and plumbing supplies and fixtures. Make sure that all installations follow local bylaws and biohazard regulations. For more information about the required environmental conditions for the system, refer to the site planning guide for the instrument.

DANGER! Explosion Hazard: The instrument is not designed for operation in an explosive environment. Do not operate the instrument in an environment containing explosive gases.

WARNING! Asphyxiation Hazard: The use of instruments without adequate ventilation to outside air may constitute a health hazard. In addition, certain procedures required during the operation of the instrument may cause gases to be discharged into the exhaust stream; under these conditions, inadequate ventilation may result in serious injury. Take extreme care to vent exhaust gases properly.

WARNING! Chemical Hazard: Make sure that the source exhaust system is properly connected, particularly if samples containing toxic or highly volatile chemicals or solvents are being analyzed. A minimum 20% positive air flow into the laboratory is required.

WARNING! Biohazardous Material: This instrument or any part is not intended to act as a biological containment safety cabinet. For biohazardous material use, always apply local legislated rules and regulations for hazard assessment, control, and handling.

Material Safety Data Sheet

An (MSDS) Material Safety Data Sheet is a document that contains information on the potential hazards and how to safely use a chemical product. MSDSs are prepared by the supplier or manufacturer of the material. Before you use any chemical product you should refer to the MSDS provided by the manufacturer or supplier for information on the use, storage, handling, and emergency procedures related to the material.

Chemical Hazards

This section provides some general safety practices that should be observed when working with any chemical.

Use, Storage, and Disposal

When handling any chemical, follow these guidelines carefully:

- Use, store, and dispose of chemicals in accordance with the supplier's recommendations and federal, state, provincial, or local regulations and laws.
- When preparing chemical solutions, always work in a fume hood that is suitable for the chemicals you are using.
- Conduct sample preparation away from the instrument to minimize corrosion and contamination.
- Do not put open containers of solvent near the instrument.
- Store solvents in an approved cabinet away from the instrument.
- Wear appropriate eye protection at all times when handling chemicals. Use safety glasses with side shields, goggles, or full-face shields, depending on the types of chemicals you will be handling.

WARNING! Biohazardous Material: If hazardous, biohazardous, or radioactive materials have been analyzed in the instrument, take all necessary precautions as outlined on the MSDS (Material Safety Data Sheet) when cleaning the interface, ion source, and vacuum chamber components.

WARNING! Biohazardous Material: Deposit biohazardous material in appropriately labelled containers. Potential risk of severe personal injury if proper procedures for handling and disposing of biohazardous materials are not followed.

WARNING! Biohazardous Material: If hazardous, biohazardous, or radioactive material is injected into the instrument, all appropriate safety precautions should be taken when handling the pump oil and oil exhaust filter. The oil may be contaminated and should be handled according to hazardous material safety regulations in the country of use. For example, WHMIS (Workplace Hazardous Materials Information System) in Canada.

Corrosive and Toxic Chemicals

The chemicals used with the instrument are potentially hazardous. If a spill occurs, follow clean-up instructions in the MSDS provided by your chemical supplier. Check regularly for chemical leaks, which represent a potential safety hazard to the operator.

The buffers used in this instrument may contain hazardous chemicals. Always determine what solutions have been used on the instrument before changing reagents or instrument components.

WARNING! Corrosive Materials: Do not use a glass drain vessel. A glass drain vessel may break and spill flammable, toxic, or corrosive liquids. Always use a drain vessel that meets the original specifications.

Reactive Chemicals

Vent reagent containers in an operating fume hood while replacing them. Opening a pressurized reagent container can cause reagent crossover, result in spills, or expose the operator to hazardous chemicals. Refer to the MSDS provided by the reagent supplier for spill clean-up and disposal precautions.

DANGER! Toxic or Explosive Environment Hazard: Do not place the drain vessel in an enclosed cabinet. Doing so could result in a build-up of hazardous gases, which may result in a toxic environment, serious explosion, or fire. Make sure that the drain vessel exhaust is vented to a fume hood or an outside port.

Flammable Chemicals

Some chemicals are highly flammable. Always use necessary precautions when handling, such as venting reagent containers in an operating fume hood and wearing proper personal protective equipment.

Flammable Chemicals Used With the Ion Source

Standard laboratory rules apply when using or handling flammable compounds with ion sources. If you use an ion source that includes a heating element with an operating temperature above the flash point of some solvents used for analysis, you must maintain and verify the instrument safety before each use.

Reagent and waste containers can crack and leak. Secure each waste container in a low-density polyethylene safety container with the covers fastened and the handles locked in the upright position.

Hazardous Waste

This section provides some general safety practices that should be observed when working with any hazardous waste.

WARNING! Hazardous Materials: Some chemicals used with this instrument can be hazardous and cause injury, illness, or death. Read the warnings prominently displayed on the container labels of all hazardous chemicals. Review all applicable MSDSs before operating the instrument or using hazardous reagents.

Hazardous Disposal and Hazardous Waste

A drain vessel is supplied with the instrument. The vessel is used to collect the effluent from the ion source. For safe operation of the instrument, maintain the drain vessel and drain tubing properly.

When working with hazardous waste, follow these guidelines carefully:

- Always place the drain vessel in an area that is visible to the operator, who can observe the level of collected effluent and empty the vessel when necessary.
- Check the condition of the drain tubing regularly to monitor deterioration. Organic solvents deteriorate the tubing more quickly than aqueous solutions. When the tubing becomes brittle or cracked, replace it.
- Drain vessels may contain flammable, acidic, caustic, organic solutions, or small amounts of the elements analyzed. You may have to dispose of the collected effluent as hazardous waste.
- Empty the drain container frequently when using organic solvents. Before switching from organic to aqueous solutions, always flush the drain tubing thoroughly and empty the drain container.
- Dispose of waste in accordance with the applicable regulations and laws.

Biohazard Disposal and Biohazard Waste

When preparing, handling, and disposing of pipettes or consumable waste, wear appropriate protective equipment in accordance with laboratory site procedures. For more information, refer to *Biosafety in Microbiological and Biomedical Laboratories*.

Electrical Hazards

If the instrument is used in a manner not specified by AB SCIEX, the protection provided by the instrument may be impaired. The instrument must be correctly connected to a suitable electrical supply. For more information about electrical requirements, refer to the site planning guide for the instrument.

Severe electrical shock can result if you try to remove the instrument panels. Contact your CSR if your system requires servicing.

WARNING! Shock Hazard: Some buffer solutions used on an instrument are extremely conductive. The upper buffer line flows directly out of the buffer container to the high voltage power supply. Turn off the high voltage power supply before changing buffer containers to avoid electrical shock.

WARNING! Shock Hazard: Dangerous voltages exist in all of the standard ion sources. Observe EXTREME CAUTION when operating the ion sources.

WARNING! Shock Hazard: Lethal voltages exist in certain areas of the instrument. Installation and internal maintenance of the instrument shall be performed only by an AB SCIEX service technician or a similarly authorized and trained person.

WARNING! Shock Hazard: Before opening any of the covers on the instrument, turn off the instrument and unplug the power cord in order to prevent exposure to high voltage.

Ion Source Electrical Hazards

During normal operation, high voltages exist in the probes. Do not operate or service the instrument without the proper protective covers or viewing glass installed while voltages are applied.

The following warning applies to ion sources that have the high voltage connection within the interface. Removing the ion source housing from the mass spectrometer disables the high voltage connection.

WARNING! Shock Hazard: Disconnect the ion source from the mass spectrometer before starting any maintenance procedures.

The following warning applies to ion sources that are not easily removed or do not have the high voltage connection within the interface.

WARNING! Shock Hazard: In the Analyst® software, set the IS (IonSpray Voltage) to 0 (zero), and disconnect the ion source voltage cable (if the source uses external high-voltage cables) before starting any maintenance procedures.

Electrical Safety

The instrument has been designed to protect the operator from potential electrical hazards. This section describes recommended electrical safety practices.

WARNING! Shock Hazard: Lethal voltages exist in certain areas of the instrument. Installation and internal maintenance of the instrument shall be performed only by an AB SCIEX service technician or a similarly authorized and trained person.

Always observe the following:

- When the instrument is connected to the mains power supply, opening instrument covers is likely to expose live parts.
- High voltages can still be present even when the mains switch is off.
- Capacitors inside the instrument may still be charged even if the instrument has been disconnected from all supply sources.
- The instrument must be correctly connected to a suitable electrical supply.

Electrical Safety Checkpoints

To avoid electrical hazards, follow these guidelines carefully:

WARNING! Shock Hazard: Disconnect the instrument from all supply sources before opening it for any adjustment, replacement, maintenance, or repair. If the opened instrument must be operated, the operation must be performed only by an AB SCIEX qualified service person who is aware of all the hazards involved.

- Do not operate the instrument while any covers or internal parts are removed.
- Do not attempt to make internal adjustments or replacements except as directed in the service manual.
- Whenever it is possible that the instrument is no longer electrically safe for use, render the instrument inoperative and secure it against any unauthorized or unintentional operation. The electrical safety of the instrument is likely to be impaired if, for example, the instrument shows visible damage, has been subjected to prolonged storage under unfavorable conditions, or has been subjected to severe stress during transportation.

Protective Conductor

The mains supply should have a correctly installed protective (earth-ground) conductor and must be installed or checked by a qualified electrician before connecting the instrument. Do not intentionally interrupt the protective conductor. Any interruption of the protective conductor inside or outside the instrument or disconnection of the protective conductor terminal is likely to make the instrument dangerous.

Non-Serviceable Parts

To reduce the chance of electric shock, do not remove covers that require tool access. Refer servicing to an AB SCIEX qualified service personnel. Use qualified personnel for the installation of all electrical fixtures, and ensure that all installations follow local codes and regulations.

Interlocks

The instrument has been designed with safety features, including interlocks, to minimize the possibility of injury due to electric shock. Do not interfere with the interlocks. Follow all warnings and cautions placed on the instrument and in the accompanying documents. Never remove the instrument panels before shutting the instrument down and disconnecting the power cord and mains supply.

Severe electrical shock can result if you defeat the interlocks located in the instrument. All covers must be closed and interlocks must be engaged before you can pump down the instrument.

WARNING! Shock Hazard: The interlocks are only mechanical latches; they do not shut down power within the instrument. When the front and back covers are opened, dangerous voltages are still present and the instrument is operational.

WARNING! Shock Hazard: Dangerous voltages exist inside the instrument enclosure. Do not attempt to override the interlock system. Only qualified service personnel shall operate the instrument with the covers removed.

Circuit Protection Devices

Improper circuit protection or an improper mains supply can damage the instrument or wiring system and cause a fire. Before turning on the instrument, verify that the branch circuit protection is as indicated in site planning guide and that the instrument voltage matches the mains supply in your laboratory.

On instruments where the ion source voltage connection is exposed, do not make the high-voltage connections until after the ion source is installed. Conversely, disconnect the high-voltage connections before removing the ion source. Pull the connector, not the cables.

WARNING! Fire Hazard: To prevent a fire hazard, replace the fuse only with a fuse of the same type and rating.

WARNING! Shock Hazard: Do not rely solely on the interlocks to safeguard you from the high voltage of the instrument. When performing routine maintenance, make sure that you turn off the mains supply circuit protection and disconnect the mains supply cord.

Burn Hazards

The temperature of the ion source probe can exceed 70 ℃ depending on the temperature and gas flow settings. Do not remove the probe and ion source from the instrument when the ion source is still hot. Allow at least 10 minutes for the ion source to cool.

WARNING! Hot Surface: Some surfaces of the source become hot during operation. Allow the source to cool for at least 10 minutes before removing the probe from the source housing or starting any maintenance procedures.

Hot Exhaust Gases

When the instrument is operating, exhaust gases are vented through the source exhaust system. For more information about exhaust vents, refer to the site installation planning guide for the system.

Laser Hazards

This section is applicable for systems that have a laser, such as a MALDI source. The embedded laser device produces invisible ultraviolet radiation. To prevent injury to your eyes, do not look directly into the anticipated path of the laser beam or at any specular reflections of the laser beam.

Laser Maintenance

Maintenance and servicing of the laser shall be done by trained personnel only. Any person who services laser equipment must be aware of the potential hazards associated with the equipment. When servicing any laser device, follow these guidelines carefully:

- Post warning signs at entrances and at prominent locations near the laser work area if service to the embedded laser is in progress.
- Limit access to the instrument to trained personnel.
- When servicing the laser, wear safety goggles appropriate for use at the emitted wavelength.

WARNING! Laser Hazard: Invisible Class 3b UV laser radiation is accessible with the covers removed and the interlocks defeated. Approved safety eye protection must be worn. Eye protection must be rated for use with the emitted wavelength.

Radiation Hazard

The instrument generates low levels of RF (radio frequency) energy, which may interfere with devices that are susceptible to RF interference, such as a pacemaker or a radio receiver at close range. The instrument is designed to contain the RF energy within the shielded enclosure of the ion source housing and the high-voltage power supply. For more information, see Regulatory Compliance on page 5. Interlocks prevent operation of the system without all covers, doors, and shields in place.

Gas Hazards

Gases used with instruments are normally stored in pressurized containers. Nitrogen is commonly used with the instrument. The major hazard associated with nitrogen is suffocation. This can occur if the gas is allowed to escape in an enclosed area and displace the oxygen in the air. Nitrogen is neither explosive nor combustible. Contact your gas supplier for an MSDS containing information on the potential hazards associated with nitrogen.

WARNING! Danger of Explosion: Pressurized gas cylinders are potentially explosive. Always cap the gas cylinder when not in use. Store cylinders standing upright, fastened securely to an immovable bulkhead or permanent wall by means of approved brackets, chains, or clamps.

Gas Cylinder Identification

All chemical or gas storage containers must be identified through the use of approved labels such as WHMIS labels.

Gas Cylinder Hazards

A pressure relief device is required on the low pressure external regulator for nitrogen containers connected to the instrument. If a relief device has not been installed, call the AB SCIEX Service Department immediately. Operating the instrument without the device can cause container explosions and physical injury.

The following hazards are associated with pressurized containers:

- Muscle strain
- Physical injury (for example, from a container falling)

Storing Cylinders

Carefully use, store, and handle compressed gases stored in cylinders. Gas cylinders can be hazardous if they are mishandled. When identifying, storing, and handling gas cylinders, follow these guidelines carefully.

- Store cylinders in accordance with federal, state, provincial, or local regulations and laws.
- Do not allow ignition sources to be stored in the storage area and keep cylinders away from readily ignitable substances such as gasoline, waste, or combustibles in bulk, including oil.
- When cylinders are stored indoors in storage rooms, the storage room should be well ventilated and dry. Make sure that the ventilation is

adequate for preventing the formation of dangerous accumulations of gas; this is particularly important in small or confined areas.

- When storing cylinders outdoors, they should be stored above the ground on a suitable floor and protected against temperature extremes (including the direct rays of the sun.)
- Do not store cylinders near elevators or gangways or in locations where heavy moving objects may strike or fall against them.
- Use and store cylinders away from exits and exit routes.
- Locate cylinders away from heat sources, including heat lamps. Do not subject compressed gas cylinders to temperatures above 52 ℃ (126 ℉).

Handling Cylinders

- Make sure that the container caps are secured and the cylinders are properly fastened to the cart before moving them.
- Do not roll or drag compressed gas cylinders. Use a wheel cart or hand truck.
- Always use a stand or safety strap when using, moving on a cart, or storing a cylinder.
- Put the protective cap back on the valve when the cylinder is not in use.
- Use only regulators, tubing, and hose connectors that are specifically approved by an appropriate regulatory agency to be used with the gas in the cylinder.
- Never lubricate regulators or fittings.
- Do not force caps off valves with tools. If caps are stuck, contact the supplier.
- Arrange gas hoses where they will not be damaged or stepped on and where objects will not be dropped on them.
- Do not refill gas cylinders.
- Check the condition of pipes, hoses, and connectors regularly. Perform gas leak tests at all joints and seals of the gas system regularly, using an approved gas leak detection solution.
- Close all gas cylinder valves tightly at the cylinder when the equipment is turned off. Drain off any liquid and make sure that there is no gas in the line before turning off the source exhaust vent.

Peripheral Devices

For information about connecting peripheral devices, refer to the *Peripheral Devices Setup Guide*.

References

Please refer to the most recent editions of the following:

- *CRC Handbook of Laboratory Safety*, ed. K. Furr, 5th ed. Florida: CRC Press, 2000.
- *Biosafety in Microbiological and Biomedical Laboratories*, 4th ed. U.S.A. Department of Health and Human Services, 1999.

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- Material Safety Data Sheets (MSDS), USA: DIN-Sicherheitsdatenblaetter (genormte Formular DIN-Nr 52900), FRG; Product Information Sheets, UK.
- Other sources of information include: Occupational Safety and Health Administration, USA (OSHA), American Conference of Governmental Industrial Hygienists, USA (ACGIH), Control of Substances Hazardous to Health, UK (COSHH).
- *Official Methods of Analysis*, ed, K. Helrich,15th ed. Arlington: Association of Official Analytical Chemists, Inc., 1990.
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- *Introduction to Microwave Sample Preparation*, eds. Kingston, H.M. and Jassie, L.B., American Chemical Society, 1988.
- *Bretherick's Handbook of Reactive Chemical Hazards*, 6th ed., Bretherick, L. London: Butterworth-Heinemann, Ltd. 1999.
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