Appendix 1

List of Safety Inspection Items for Labs of Institutions of Higher Learning (2019)

S/N	Check Item	Check Points	Records
1	**Responsibility System**		
1.1	**Institution-level Safety Responsibility System**		
1.1.1	Check if the institution-level safety work leading organization is established	Organization establishment document with reference number should be prepared to clarify the personnel and labor division.	
1.1.2	Check if functional department of laboratory safety management is established	Functional departments for laboratory safety should be established at department level and cooperate with other functional departments; it is recommended to set up laboratory safety management department in the institution which has 30,000 students and instruments and equipment priced over RMB 300 million; independent department can be omitted in small-scale institutions or liberal art institutions.	
1.1.3	Check if the institution has signed responsibility agreement of laboratory safety management with colleges and departments	The responsibility agreement should be signed by incumbent institution leaders, and signed and stamped by competent leaders of colleges and departments.	
1.2	**College & Department-level Safety Responsibility System**		
1.2.1	Check if party leader of secondary unit acts as the responsible person of laboratory safety	Check documents of colleges and departments	
1.2.2	Check if safety work leading team of college & department-level laboratory is	The safety work leading team should be led by colleges and departments' Party leader and participated by the safety leaders of laboratory and heads of research institute,	

S/N	Check Item	Check Points	Records
	established	center, teaching and research office and laboratory.	
1.2.3	Check if safety responsibility system is established in college & department -level laboratory	Safety director and manager should be allocated in research institute, center, teaching and research office and laboratory; check the documents released by colleges and departments; check data or network management system and pay attention to the distribution of multiple campuses.	
1.2.4	Check if safety responsibility statement of laboratory is prepared	Sign responsibility statements with safety director and each teacher using labs.	
1.3	**Fund Guarantee**		
1.3.1	Check if the institution has regular budget for laboratory safety on a yearly basis	Check financial evidence	
1.3.2	Check if the institution has used special funds for safety construction and management of laboratory and the funds for rectifying major risks can be distributed	Check financial evidence	
1.3.3	Check if the colleges and departments have raised funds for construction and management of laboratory safety	Check financial evidence	
1.4	**Team Construction**		
1.4.1	Check if the institution has allocated full-time or part-time laboratory safety manager as needed	It is recommended to allocate full-time laboratory safety management staff in colleges and departments of science (except for mathematics), industry, agriculture and medicine; allocate part-time laboratory manager in colleges and departments of liberal arts, management, arts and mathematics; promote the construction of professional safety team and guarantee stable and sustainable development of team.	
1.4.2	Check if laboratory safety inspection/assistance team comprising teachers, experiment technicians (including	Documents of establishment or employment should be available. Check the work records.	

S/N	Check Item	Check Points	Records
	those who are rehired after their retirement) or students is established		
1.4.3	Check if directors of laboratory safety have passed training of laboratory safety management within 1 year after work.	Training certificates should be available.	
1.5	**Others**		
1.5.1	Check if laboratory safety is managed by informatization means	Set up and improve information management system and monitoring warning system for laboratory safety gradually.	
1.5.2	Check if complete files of laboratory safety are established	Including archived data of responsibility system, team construction, safety system, award & penalty, education training, safety inspection, rectification of risks, accident investigation and treatment, specialty safety, other regular or periodic work; the files should be provided with standard and reasonable classification for easy reference.	
2	**Rules and Regulations**		
2.1	**Laboratory Safety Management System**		
2.1.1	Check if the institution-level management methods of laboratory safety are available	General rules of institution-level labs safety management, safety risk evaluation system, full-period hazard source management system, laboratory safety emergency system, award & penalty responsibility investigation system and safety training system should be established; the system documents should be provided with formal reference number of institution; the documents should be revised and updated in time; the documents should be operable or have actual management effects.	
2.1.2	Check if detailed management rules for laboratory safety are available		
2.1.3	Check if college & department-level laboratory safety management systems are available	The laboratory safety management system which has subject characteristics should be established, including safety inspection, duty, experiment risk evaluation, laboratory access, emergency plan and safety training of colleges and departments; the system documents should be provided with colleges and departments reference number, be revised and updated in time; the documents should be operable or have actual management effects.	

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3	**Safety Publicity and Education**		
3.1	**Safety Education Activities**		
3.1.1	Check if required courses or optional courses of laboratory safety are offered step by step	Required courses for safety education with credit should be offered gradually for high-risk colleges and departments and specialties, such as chemistry, biology and radiation. It is recommended to set up optional course of safety in other specialties.	
3.1.2	Check if safety education and training for teachers and students are launched on a yearly basis	Check the historical archiving records, including training date, contents, number of trainees, notification and photos of training place.	
3.1.3	Check if professional safety trainings are launched in colleges and departments	Check the records, pay higher attention to the external personnel, especially the new postgraduate students who haven't registered yet	
3.1.4	Check if emergency drills are launched based on the characteristics of subject	Check the files, including contents, number of personnel and effectiveness evaluation.	
3.1.5	Check if relevant examination of laboratory safety is organized	It is recommended to include the general knowledge and classified safety knowledge of subjects, safety specification, national laws and regulations and emergency measures into the question bank; new teachers and staffs, undergraduates and postgraduate students should pass such examination to get the qualification certificate.	
3.2	**Safety Culture**		
3.2.1	Check if safety culture applicable to the institution characteristics is established	Specific site should be reserved in webpage of institution and colleges and departments for safety publicity and experience exchange.	
3.2.2	Check if manual of institution laboratory safety is printed	Distribute manual of laboratory safety to each teacher and student	
3.2.3	Check if publicity and education mode is innovated and construction of safety culture is strengthened	Strengthen safety publicity through WeChat official account, safety briefing, and month of safety culture, rectification activities of safety, safety standard of laboratory, safety evaluation of laboratory, contest of safety knowledge and production of micro films.	
4	**Safety Check**		

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4.1	**Hazard Identification**		
4.1.1	Check if list of hazard distribution is established at institution and college level	The list should include the information of units, room, category, quantity and responsible person	
4.1.2	Check if warning marks are set at the conspicuous position of experiment places where hazard sources are used.	The high-risk places which contain hazard sources, such as highly toxic products. pathogenic microorganism, radioactive isotope, should be provided with warning marks at the conspicuous position	
4.1.3	Check if risk evaluation and emergency control plan is established for important hazard sources	They should be established by laboratory and reported to colleges and departments for archiving	
4.2	**Safety Check**		
4.2.1	Check if regular/irregular inspection is launched at level of institution	It is recommended to carry out at least 4 inspections each year, keep records and do archiving	
4.2.2	Check if regular inspection is launched at college & department level	It is recommended to carry out at least 1 inspection each month, keep records and do archiving	
4.2.3	Specific inspection should be launched to the high-risk experiment items	Specific inspection should be implemented to the highly toxic products, pathogenic microorganisms and radioactive sources	
4.2.4	Check if on-duty account is established in laboratory rooms	The last person to leave should check water, power, gas, door and window and sign on the account each day.	
4.2.5	Check if safety inspectors are provided with professional protection and metering instruments	The safety inspectors should wear marks and take photographic equipment; wear necessary PPE before entering the laboratory of chemistry, biology and radiation; wear personal radiation dosimeter before entering the radiation places; if possible, wear the necessary measurement and metering instruments (such as electro probe, multimeter, sound level meter and anemograph)	
4.3	**Rectification of Safety Hazards**		
4.3.1	Check if problems detected are reported to responsible persons in writing	The means of notification includes online notification, safety briefing of laboratory and rectification notice, among which, the rectification notice should include the	

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		problem description, rectification requirements and deadline, stamp and seal of functional departments, and should be signed for receiving by the inspected colleges and departments; the data and specification should be modified and archived.	
4.3.2	Check if risks of colleges and departments are rectified in time	The rectification report should be submitted to management department of institution in time for archiving; for any major risks, the laboratory should stop experiment activities immediately but adopt protection measures, and only continue the use of experiment until rectification has been completed in the first place.	
4.4	**Safety Report**		
4.4.1	Check if safety inspection notification is released by institution on a regular/irregular basis	Check relevant data	
4.4.2	Check if colleges and departments have launched safety inspection and kept rectification records	Check the archived contents	
5	**Experimental Laboratory**		
5.1	**Laboratory Environment**		
5.1.1	Safety information board should be pasted in the experiment places which have hazard sources	Safety information board should be placed at the door of each room, including the following information: Safety risk points, warning mark, safety director, hazard category, protective measures and valid emergency telephone; such information should be updated in time.	
5.1.2	Check if experiment places have reasonable layout of safety space	It is recommended to set at least 2 safety exits for laboratories with floor area above 200 m^2, and set 2 doors for laboratories with floor area above 75 m^2; the corridor of laboratory should be reserved with firefighting access with net width above 2.0 m; the storey height for operation area of laboratories should not be lower than 2 m; the per capita area for science and medical laboratories should not be less than 2.5 m^2.	
5.1.3	Check if firefighting access is barrier free,	The firefighting access should be kept unblocked	

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	public places should not be blocked by instruments and articles		
5.1.4	Check if construction and decoration of laboratory conform to the safety requirements of firefighting	The experiment operating floor should be made of qualified, waterproof and corrosion-prevention materials; the instruments and equipment installed should conform to the bearing loads of buildings; ceiling is not recommended in laboratories where inflammable gas is used;	
5.1.5	Check if emergency spare key is prepared for each room of laboratories	The emergency spare keys should be stored intensively and managed by a specially-assigned person for easy use in case of emergency.	
5.1.6	Check if experiment equipment is provided with shielding of vibration and noise	Vibrating equipment should be shielded against the vibration source; the equipment which generates magnetic field or subject to magnetic field interference should be provided with magnetic shielding; generally, the noise of laboratory should not lower than 55 dB (or lower than 70 dB for machinery equipment)	
5.1.7	Check if water, power and gas pipelines of laboratories are provided with reasonable layout, standard installation and construction	For laboratories which are supplied with gas via pipelines, the gas pipelines and valves should be damage-free and have clear marks; the gas supply pipelines should be marked and damage-free; the high-temperature and fired equipment should have safety interval and distance with the pipelines of inflammable gas.	
5.2	**Hygiene and Daily Management**		
5.2.1	Check if partitions of laboratories are mutually independent and have reasonable layout	The experiment areas which contain toxic and harmful substances should be separated from the learning area. Pay much attention to the reasonable layout of chemical and biological laboratories.	
5.2.2	Check if laboratories are neat, sanitary and ordered	Articles in laboratories should be placed in good order, have good hygiene status, be put back after use and there should have no wastes or irrelevant articles; do not sleep or stay overnight in laboratories, or store and cook food or drink in laboratories; do not smoke or use inflammable mosquito incense in chemical and biological laboratories.	
5.2.3	Check if hygiene and safety duty system is established in laboratories	The personnel must stay at posts during experiment period and keep records of duty	

S/N	Check Item	Check Points	Records
5.3	**Other Safety Items of Laboratory**		
5.3.1	Check if the laboratories are numbered, registered and tabulated	Check the site	
5.3.2	Check if laboratories with hazards are provided with first-aid materials	Do not lock the medical kit, but do regular inspection to see if drugs are within the quality guarantee period	
5.3.3	Check if the abandoned laboratories are provided with safety protection measures and obvious marks	The hazardous laboratories and equipment should not be dismantled until they have passed safety evaluation.	
6	**Safety Facilities**		
6.1	**Firefighting Facilities**		
6.1.1	Check if laboratories are provided with proper firefighting equipment and regular training on use of such equipment	The firefighting equipment in laboratories, such as smoke detector, fire extinguisher, fire blanket, fire sand and barrel and fire sprinkler should be effective and convenient for use; the fire extinguishers should be allocated correctly; the fire extinguishers in valid period (position of pressure pointer is normal) should have normal safety pin (pull pin) and stay away from damage and corrosion; the quantity of fire extinguishers in public areas should conform to the safety grade of laboratories.	
6.1.2	Check if emergency evacuation map is pasted at the conspicuous position	The map should provide at least 2 evacuation routes; the routes should conform to the realities; the major evacuation route (indoor space, stairs, channel and exit) should be provided with sufficient emergency light and normal functions;	
6.2	**Emergency Spraying and Eyewash Device**		
6.2.1	Check if emergency spraying and eyewash devices are installed in experiment areas where chemical and biological damages might happen	Guidance marks should be placed at the conspicuous position	
6.2.2	Check if emergency spraying and eyewash devices are installed reasonably and	The installation place of emergency spraying should be connected to working areas, with the distance not over 30 m; make sure emergency spraying is installed at correct	

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	available for use	position, the pull rod is installed at proper position and correct direction; the main valve for water pipe of emergency spraying device should be normally opened and there's no obstacle below the spray header; do not replace the emergency spraying device with an ordinary shower; the eyewash device should be connected to pipelines of domestic water, have proper water volume and pressure (ejection height is 8-10 cm) and water flow should be unblocked and smooth.	
6.2.3	Check if emergency spraying and eyewash devices are maintained regularly	Keep records of inspection (open valves on a monthly basis and make sure water flow of pipe is smooth); wipe the eyewash nozzle on a weekly basis to avoid rust water or dirty water	
6.3	**Ventilation System**		
6.3.1	Check if laboratories are equipped with up-to-standard ventilation systems	The fans should be resistant to corrosion if being used in pipeline, or be resistant to explosion if being used in places which contain inflammable gas; the ventilation system of laboratories should be normal, with the wind speed of 0.35-0.75 m/s at cabinet surface and should be provided with regular maintenance and inspection; the roof fan should be firmly fixed and stay away from abnormal noise.	
6.3.2	Check if fume cupboard has reasonable allocation, normal use and conforming operation	Devices (such as activated carbon, photocatalytic decomposition and water spraying) should be installed on the pipelines of fume cupboard to absorb or handle the toxic and harmful gas as needed; the experiments which may generate high-concentration harmful gas and personal exposure, or produce and accumulate inflammable & explosive gas or steam, must be conducted in the fume cupboard; while conducting an experiment, adjust the window to the position which is 10-15 cm from table, maintain good ventilation effects and protect the chest and higher part of operators; the tempered glass should be used. While conducting experiment in fume cupboard, do not put head in adjusting door, nor place disposable gloves or plastic bags in it to avoid blockage of exhaust port; articles in fume cupboard should be about 15 cm away from the adjusting door to avoid falling.	
6.4	**Access Control and Monitoring**		

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6.4.1	Check if access control and monitoring facilities are installed at important places and managed by a specially-assigned person	Pay higher attention to managing the hazard sources, such as highly toxic products, pathogenic microorganism, and special equipment and storage places of radioactive sources.	
6.4.2	Check if access control and monitoring system is normal and matched with the access system of laboratories	Make sure there's no dead angle in monitoring, images are clear and access records of personnel are trackable; the recommended storage period of video records is over 1 month; the electronic access control system should maintain power-on status in case of power failure.	
6.5	**Explosion Prevention of Laboratory**		
6.5.1	Check if explosion-proof laboratories conform to the requirements of explosion-proof design	The explosion-proof laboratories should be installed with explosion-proof switches and lamps, necessary gas alarm system, monitoring system and emergency system against failure of power and water supply; flame arrester should be installed at the inlet/outlet of devices which may generate inflammable gas or steam; ventilation of laboratories should be strengthened to keep concentration of explosives below the lower limit of explosion	
6.5.2	Check if instruments and equipment with explosion hazards are well protected	They should be protected by proper safety covers	
7	**Basic Safety**		
7.1	**Basic Safety of Power and Water**		
7.1.1	Check if electrical safety of laboratories conforms to national standards (guide rule) and industry standard	Electric capacity and plug and socket of laboratories should be matched with the power of power consumption equipment and be free from unauthorized transformation; the power sockets must be firmly fixed; the electrical equipment should be provided with air switch and leakage protector; do not connect electric wire and cable without permission, or use aged cables, twisted pairs or wooden power distribution board; it is forbidden to supply power through tandem connection of multiple wiring boards and such wiring board should not be directly placed on ground; the wire terminal should be reliably insulated, there's no exposed wiring and	

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		cables on ground should be provided with cover plate or sheath; the high-power instruments (including air conditioner) should be powered by specific socket (do not use wiring board), with the power load conforming to the requirements; the instruments should be powered off if being idled for long period; cut off the charging source of charger if it is unattended.	
7.1.2	Check if electric circuit and equipment of special laboratories containing inflammable & explosive gases are provided with explosion-proof electric circuits and devices	They should conform to the standards of electrical equipment in explosive environment	
7.1.3	Check if water supply/drainage system is arranged reasonably and can function normally	The water channel, floor drain and sewer should be smooth; the faucet, water supply and drainage pipes should be damage-free; the connection pipes should stay away from aging and damage (especially the rubber pipe interface of cooling and condensing system); the experiment technicians should clearly know the position for main valve of water pipes in floors and laboratories.	
7.2	**Personal Protective Equipment (PPE)**		
7.2.1	Check if experiment personnel are provided with proper PPE	The personnel should wear proper long-sleeve lab coat or protective clothes before entering the laboratories; wear goggles, protective gloves, safety helmet, protective hat, respirator or mask (respirator or mask should be within valid period and be sealed if unused) as needed; do not wear contact lenses when conducting chemical, bio-safety and high-temperature tests; do not wear scarf, silk scarf or tie when operating rotary equipment such as machine tool; wear chemical or biological experiment clothes or wear experiment gloves, do not enter/leave the non-experiment area without permission.	
7.2.2	Check if PPE are stored dispersedly and provided with obvious marks	The PPE, such as chemical protective clothing, should be dispersedly stored in safe places for easy use in case of emergency.	
7.2.3	Check if PPE training is organized and has regular inspection and maintenance records	Check the records of training and maintenance	

S/N	Check Item	Check Points	Records
7.3	**Others**		
7.3.1	Hazardous experiment (such as high temperature, high pressure and high-speed rotation) must be conducted by two operators simultaneously	Do not leave the post when conducting the test. The overnight experiment must be conducted by at least two operators after passing the review system.	
7.3.2	Check if experiment table is neat and experiment records are standard	Check the experiment table and experiment records	
8	**Chemical Safety**		
8.1	**Procurement, Acceptance and Release of Dangerous Chemicals**		
8.1.1	Check if hazardous chemicals are purchased from the qualified companies with production and management permit of hazardous chemicals	Check the copies of administration license and qualification certificate of suppliers	
8.1.2	Check if procurement procedure of highly toxic products, precursor chemicals, potential explosives and explosives conforms to the regulations	Such hazardous chemicals should be purchased from a qualified company approved by institution, and approved and archived by public security department; the functional departments of university should keep the data and establish files; never purchase controlled chemicals from the external units without permission; check the approval records of superior competent departments and review records of institution; standard acceptance records should be kept when purchasing hazardous chemicals.	
8.1.3	Check if an early application is submitted to the food and drug administration management department prior to procurement of narcotic drugs and psychotropic drugs	Such drugs should be purchased from the designated suppliers or producers after the approval of application	
8.1.4	Check if transport safety of chemicals and gases are guaranteed; whether transport	Check the data and do spot-check at site	

S/N	Check Item	Check Points	Records
	vehicles, personnel and methods in institutions are conforming to the specifications		
8.2	**Storage of Chemical Reagent in Laboratory**		
8.2.1	Check if dynamic account is established for the use of chemicals in laboratories	Establish directory, MSDS or safety card for hazardous chemicals of the laboratories for easy reference; clean the overdue drugs regularly to avoid accumulation	
8.2.2	Check if reagent drugs are stored in specific space scientifically and orderly	The storeroom, storage area and storage cabinet should be ventilated, thermal-insulated, sun-proof and safe; the storage area of organic solvents should stay away from the source of heat and ignition; the reagents subject to easy leakage and volatilization should be fully ventilated; no outlet or wiring board should exist in the reagent cabinet; the chemicals should be orderly placed by category; protection functions against secondary leakage, absorption or overflow should be provided; do not stack the reagents, have mixed storage of contraindicated chemicals, place solids and liquids in disorder or keep reagent bottle opened; do not store chemical reagents in experiment bench unless it has a baffle.	
8.2.3	Check if total quantity of hazardous chemicals in laboratories conform to the requirements of specification	In principle, the total quantity of hazardous chemicals should not exceed 100 L or 100 kg, among which, the total quantity of inflammable & explosive chemicals should not exceed 50 L or 50 kg, and capacity of single packaged container should not exceed 20 L or 25 kg; leakage alarm and ventilation linkage device must be installed if single experiment device has Class A material tanks over 10 L, or Class B material tanks over 20 L or Class C material tanks over 50 L. The storage quantity of hazardous chemicals can be checked by laboratory area on basis of the standard laboratory area of 50 m^2.	
8.2.4	Check if chemical labels are obvious, complete and clear	Up-to-standard labels should be pasted on packages of chemicals and be repasted if such chemicals are transferred or divided into other packages. The chemical labels should be timely supplemented if falling or becoming fuzzy and corroded; otherwise, it should be handled as wasted chemicals.	

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8.3	**Operational Safety of Experiment**		
8.3.1	Check if process instructions and emergency plans are prepared for hazardous experiments and chemicals	The instructions and plans should be pasted on walls or be easily accessible; experiment should be conducted in accordance with the instructions; the experiment personnel should be familiar with hazards and emergency treatment measures.	
8.3.2	Check if hazardous chemical processes and devices are provided with auto control and power redundancy	Auto control system should be installed in the reaction devices related to hazardous processes and hazardous chemicals under strict control; the production devices related to hazardous processes and chemicals with exothermic reaction should be powered by dual power suppliers and be provided with UPS.	
8.3.3	Check if gases with toxicity and peculiar smell are collected and protected	Experiment which may generate gases with toxicity and peculiar smell should be conducted in fume cupboard; meanwhile, gas absorption device should be installed at the end of experiment device; proper and effective respirator should be used.	
8.4	**Management of Controlled Chemicals**		
8.4.1	Check if precursor chemicals and potential explosives are stored by category, kept by a specially-assigned person and provided with receiving, use and handling records	The Class 1 precursor chemicals should be managed based on “five doubles” systems (double-person acceptance, double-person keeping, double-person receiving, double locks and double accounts); specific safe box should be used for storing the highly toxic products, firmly fixed and managed based on double persons and double locks; the highly toxic products with high volatility and low flash point should be stored in explosion-proof refrigerator and provided with two locks; monitoring and alarm device should be used; the highly toxic products should be used by at least two operators, and be handled in strict accordance with the SOP.	
8.4.2	Check if explosives are isolated, stored at limited amount, used and destroyed as specified by public security department	Check the site and record book; annual list should be provided by functional departments	
8.4.3	Check if narcotic drugs and psychotropic drugs are stored in specific safe box and provided with standard accounts for receiving, use and handling	Check the site and record book; annual list should be provided by functional departments	

S/N	Check Item	Check Points	Records
8.5	**Management of Experiment Gas**		
8.5.1	Check if experiment gases are purchased from the qualified suppliers and accounts are established for gas cylinders	Check records	
8.5.2	Check if gases are stored and used as specified	Storage places for cylinders of hazardous gases should be ventilated, away from heat source and sunlight, have smooth and dry ground; gas cylinder cabinet or cylinder anti-tilting chain and barrier should be installed; cylinders containing a large amount of gas should not be stacked; only one cylinder of oxygen and inflammable gas can be stored in each laboratory, and other gas cylinders should be controlled at the minimum amount; do not place the gas cylinders at public places such as corridor and hall; the places containing highly toxic, inflammable & explosive gases should be provided with ventilation facilities and proper monitoring and alarm devices, and pasted with necessary safety warning marks; do not mix the combustion-supporting gases, such as inflammable gas and oxygen; establish independent gas cylinder room, keep it well ventilated, avoid mixed storage, install monitoring device, make sure pipelines are numbered and cylinders can be tracked; such cylinders should be managed and recorded by a specially-assigned person.	
8.5.3	Check if necessary gas alarm devices are installed	The confined spaces containing large amount of inert gases or liquid nitrogen and CO_2 should be well protected against leakage or anoxia due to evaporation, and be installed with oxygen content alarm table.	
8.5.4	Check if gas pipelines and cylinders are connected correctly and provided with clear marks	Pipelines should be made of proper materials, stay away from damage or aging, and be provided with gas leakage inspection on a regular basis; the rooms containing multiple gas pipelines must be pasted with detailed pipeline diagram; the steel cylinders should be inspected regularly and provided with qualification marks (by supplier); unused steel cylinders should be provided with cylinder cap; the gases in steel cylinder should be known to all and no overdue cylinder is allowed; the three statuses of “full, in use and used up” should be confirmed; the main valve of cylinder	

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		should be closed in time.	
8.6	**Handling of Chemical Wastes**		
8.6.1	The chemical wastes should be handled by the qualified units (enterprises)	The chemical wastes should be tightly packaged and timely sent to the transfer station or collection points of institution; the institution should clean and transport the experimental wastes in time and avoid outdoor stacking of them; do not mix the chemical solid wastes and domestic wastes, nor pour used chemical reagents and waste liquids into the sewer. Check the commission contract and qualification of handling unit.	
8.6.2	Check if the institution has unified labels of experiment wastes	Label information includes: Waste category, hazardous characteristics, main ingredients, production department, sending and storage personnel and date.	
8.6.3	Check if classified containers of experiment wastes are prepared	The chemical wastes should be collected and stored by type (avoid mixing of wastes with drastic action), labels are pasted and covers are not open; do not store large number of chemicals in laboratory; the storage position of experiment wastes should not be disturbed, label information should be clear and chemicals should not exceed 2/3 of total capacity if being stored in a large barrel; the high-risk wastes should be packaged independently and label information should be clear; do not mix the different chemicals, but store them in the original cylinder and paste the labels of wastes.	
8.7	**Warehouse of Hazardous Chemicals and Transfer Station of Wastes**		
8.7.1	Check if the institution has established warehouse of hazardous articles, transfer station of experiment wastes and wastes are intensively stored at the designated position	The warehouse of hazardous articles, transfer station of experiment wastes must be provided with ventilation, thermal insulation and free from sunlight, be protected against theft, explosion, static electricity, and be provided with leakage alarm, emergency spraying and safety warning marks; conform to the regulations and be managed by a specially-assigned person; the firefighting facilities (such as fire extinguisher, fire blanket, sandbox and automatic spraying) should be correctly allocated in accordance with national regulations; if being temporarily stored in	

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		laboratories, the hazardous articles and wastes should be provided with management and control measures such as warning, ventilation, thermal insulation, sunlight avoidance, protection against theft, explosion, static electricity, leakage alarm and emergency spraying, and the storage area should be less than $30m^2$; do not mix the hazardous articles and wastes, make sure stacking height of packaged reagent is not above 1.5 m; the temporary storage warehouse should not be set in basement.	
8.8	**Other Chemical Safety**		
8.8.1	Check if the institution has unified labels of reagents	Label information includes name, concentration, responsible person, date and storage conditions; the labels on containers of reagent, synthetics and samples should have clear information; do not store the reagent or sample in the beverage bottle; if inevitable, remove the original package but paste the unified reagent labels.	
8.8.2	Check if glass wares are used, such as damaged measuring cylinder and test tube	Check the site	
8.8.3	Check if beakers and flasks of reagent are covered	Check the site	
9	**Biological Safety**		
9.1	**Qualification of Laboratory**		
9.1.1	Check if the laboratories engaged in experiment research of pathogenic microorganism have corresponding safety grade and qualification	The BSL-3/ABSL-3 and BSL-4/ABSL-4 laboratories must be approved by government departments prior to establishment; once being built by institution, the BSL-1/ ABSL-1, BSL-2/ ABSL-2 laboratories should be reported to government health or agriculture departments for filing; check the qualification certificate and reported data.	
9.1.2	Check if tests of pathogenic microorganism are reported to health or agriculture department for record filing	Check the reported data	
9.1.3	Check if experiments of pathogenic	The experiments and researches on inactivated highly pathogenic microorganisms	

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	microorganisms are launched in the laboratories of specified levels	(Class 1 and 2) must be conducted in BSL-3/ABSL-3 and BSL-4/ABSL-4 laboratories; while the experiments and researches on lowly pathogenic microorganisms (Class 3 and 4) or inactivated highly pathogenic infectious materials must be conducted in BSL-1/ ABSL-1, BSL-2/ ABSL-2 or higher laboratories.	
9.2	**Place and Facilities**		
9.2.1	Check if safety protections of laboratories conform to the requirements of bio-safety laboratories, regional distribution is reasonable and air pressure is normal	Access control management and access system must be adopted in the BSL-2/ABSL-2 and higher laboratories; the storage area and cabinets of pathogenic microorganism should be installed with anti-theft, monitoring and alarm devices	
9.2.2	Check if bio-safety facilities conforming to requirements are allocated	Class II bio-safety cabinets should be allocated and inspected on a regular basis; Class B bio-safety safety cabinets should be provided with normal ventilation system; install pressure steam sterilizer, monitor the sterilization effects regularly and paste the safety operation instructions on wall; firefighting facilities, emergency power supply (maintain power supply for at least half an hour), emergency shower and eyewash devices should be equipped; make sure delivery window is normal and do not store articles inside it; install insect-proofing screen window and put mouse baffle at the entrance.	
9.3	**Procurement and Storage of Pathogenic Microorganism**		
9.3.1	Check if highly pathogenic microorganisms (toxin) species are purchased or separated, application and reporting procedures are handled	The pathogenic microorganism should be purchased from the qualified institution and be attached with quality certificates; be reviewed according to the process of institution and reported to competent departments in industry for approval; the pathogenic microorganism should be transferred and transported after approval of hygiene and agriculture departments in accordance with corresponding packaging requirements.	
9.3.2	Check if highly pathogenic microorganisms (toxin) species are properly kept and managed strictly	The pathogenic microorganisms (toxin) species should be stored in the locked refrigerator or cabinets; the highly pathogenic microorganisms should be managed by two personnel using two locks; keep records for the storage, experiment, use and	

S/N	Check Item	Check Points	Records
		destruction of pathogenic microorganisms (toxin) species.	
9.4	**Personnel Management**		
9.4.1	Check if personnel engaged in experiment and research of pathogenic microorganism have passed the specific training	The personnel should pass evaluation and get the certificate. Check the archived data.	
9.4.2	Check if workers of highly pathogenic microorganisms are provided with proper medical assessment	Implement monitoring and treatment plan and keep the medical records properly; receive physical examination before and after work, accept regular physical examination if working for long period.	
9.4.3	Check if corresponding personnel access systems are established	The external personnel should be approved by responsible person, be provided with education training and safety control measures before entering the bio-safety laboratories; those having a cold or fever are allowed to conduct experiment of pathogenic microorganism.	
9.5	**Operation and Management**		
9.5.1	Check if bio-safety and SOP are established	The SOP for conducting experiment of pathogenic microorganism should be prepared	
9.5.2	Check if risk evaluation and emergency plan are prepared before conducting the experiment activities	Risk evaluation and emergency plan should be prepared in BSL-2 /ABSL-2 and higher laboratories before launching the experiment activities of pathogenic microorganism, including the written operation procedures against the overflow and accidents of pathogenic microorganism and infectious materials.	
9.5.3	Check if experiment operation is conforming to regulations and safety protection measures are reasonable	Conduct experiment in proper bio-safety cabinet; do not conduct experiment of pathogenic microorganism in clean bench; operate high-speed centrifuge safely, avoid overflow or aerosol emission due to damage of centrifuge tube or cover; keep records for experiment activities of pathogenic microorganism; the records for experiment activities of pathogenic microorganism should be available; proper personal protection measures should be available; it is forbidden to wear protective gloves when operating the facilities and equipment (including instruments, refrigerators, computers, telephones, switches, doors and windows and drawers of	

S/N	Check Item	Check Points	Records
		cabinet).	
9.6	**Safety of Experimental Animals**		
9.6.1	Check if purchasing, feeding and dissection of experimental animals conform to the regulations	The places of feeding experimental animals should have qualification certificates; the experimental animals should be purchased from the qualified suppliers that have quality certification; the experimental animals for dissection purpose should pass inspection and quarantine; keep safety during dissection of experimental animals.	
9.6.2	Check if experimental animals are provided with ethical reviews to guarantee the rights and interests of animals	Check the records	
9.7	**Handling of Biological Experiment Wastes**		
9.7.1	Check if biochemical wastes are handled in the specific and centralized places	The institution should sign contract with the qualified institutions to handle the biochemical wastes and keep records of handover; the institution should establish the transfer station for biochemical solid waste; once animal experiment is completed, send the biological wastes to the institution's transfer station or collection points for necessary sterilization and inactivation; prepare garbage can (with yellow plastic bags inside generally) and labels; institution has unified labels for the biochemical experiment wastes.	
9.7.2	Check if handling of biological wastes conforms to the special requirements	The highly toxic EB glue generated in biological experiment should be stored intensively, pasted with labels of chemical waste and timely sent to the institution's transfer station or collection points; the sharp objects such as blades and pipette tip should be placed in box/carbon resistant to punching, then packaged into yellow plastic bags and pasted with labels; the experiment wastes of pathogenic microorganism must be provided with high-temperature and autoclaved sterilization or chemical immersion; the handling of wastes from highly pathogenic biomaterials should be tracked; do not put biochemical experiment waste into garbage can and vice versa.	

S/N	Check Item	Check Points	Records
10	**Radiation Safety**		
10.1	**Laboratory Qualification and Personnel Requirements**		
10.1.1	Check if institution with radiation source has acquired “radiation safety permit”	The experiments should be conducted based on the specified type and amount of radionuclide within the specified range of radiation type; X-ray apparatus above Class 3, such as X-ray diffractometer, should be included into the scope of license and provided with strengthened management.	
10.1.2	Check if radiation source operators have passed specific training and occupational physical examinations regularly	The radiation source operators should possess *Quality Certificate for Radiation Safety and Protection* (be retrained in every 4 years), participate in radioactivity occupational physical examination (biennial) and be provided with health files; the radiation source operators must wear personal dosimeter before entering the experiment places; qualified institutions should be entrusted to do regular dose detection (trimonthly).	
10.2	**Facility, Procurement and Transport**		
10.2.1	Check if warning, linkage and alarm devices are set at radiation facilities and places	The storage tank of radiation sources should be provided with double-door and double-controller configuration, safety alarm system (networked to public safety department), video monitoring system, radiation facilities and equipment, ray devices above Class 2, normally-functioning safety interlock and alarm devices. Obvious safety warning labels, warning line and dose detector should be installed.	
10.2.2	Check if experiment places of radiation sources are provided with annual test reports	Check the site, verification certificates and test reports	
10.2.3	Check if institution has prepared specific containers and temporary storage warehouse for radiative wastes	The non-sealed radioactivity laboratories should be provided with attenuation pool or specific non-sealed recovery and disposal places	
10.2.4	Check if purchase, transfer and transport of radioactive substances are reported and approved as specified	The purchasing, transfer and transport of radiation sources and radioactive substances should be approved and archived by institutions and government environmental protection departments; environmental impact assessment must be conducted prior to	

S/N	Check Item	Check Points	Records
		purchasing and transfer of the equipment above; the transfer and transport of radioactive substances should be approved and archived by institutions and public safety department; the radiation source, radioactive substances and the radiation devices over Class 3 should be registered prior to a change.	
10.3	**Radioactive Experiment Safety and Waste Disposal**		
10.3.1	Check if SOP, safety plan and emergency plan of radiation devices are prepared and executed in line with national regulations	Pay higher attention to the experimental operation of Γ radiation, electron accelerator, X-ray flaw detector, non-sealed radioactivity experiment and the sealed radioactivity experiment above Class 5.	
10.3.2	Check if radiation source and equipment are abandoned in accordance with disposal plans or recovery agreements specified in national regulations	Solid and liquid wastes for intermediate and long half-life nuclides should be provided with handling plans or recovery agreements which conform to national regulations; after being placed for 10 half-life periods and passing the test, the solid and liquid wastes of short half-life nuclides should be handled as ordinary wastes and be provided with handling records; the equipment containing radiation sources or may generate radioactivity should be abandoned according to national regulations after approval of management department of institutions ; crack the X-ray tube should be cracked when abandoned and take photos as evidence; the laboratories of radiation source should be abandoned in accordance with national regulations.	
11	**Electromechanical Safety**		
11.1	**Routine Management of Instruments and Equipment**		
11.1.1	Check if equipment is provided with account, asset tag and real-name system management	Check the electronic or paper account	
11.1.2	Check if large and special equipment is used in accordance with regulations	The large and high-power instruments and equipment should be matched with the circuit capacity, be provided with operation & maintenance records, SOP or attention	
11.1.3	Check if power supply and consumption of instruments and equipment conform to the	The earthing system of instruments and equipment should be made of copper according to regulations, with the designed service life not less than 50 years and	

S/N	Check Item	Check Points	Records
	requirements	ground resistance not above 0.5 Ω; unless otherwise permitted, the computer, air conditioner, electric heater and water dispenser should not be powered on all night long; necessary protective measures (such as 2-way power supply, UPS and monitoring alarm) should be adopted for the special instruments and equipment requiring uninterrupted power; the equipment which operate all day long should be provided with real-time monitoring facilities.	
11.1.4	Check if safety and protection measures are adopted for special equipment	Pay higher attention to the special equipment with high temperature, high pressure, high-speed running and electromagnetic radiation, organize training to users and provide safety warning marks and lines (yellow); the ultra-high-speed centrifugal machine should be placed in the centrifugal chamber; self-developed equipment should be designed giving full considerations to safety coefficient and be provided with safety protection measures.	
11.2	**Machinery Safety**		
11.2.1	Check if machinery equipment is clean, neat and reliably earthed	Key points: Keep the machine tool clean and tidy; never place sundries at head and top of machine tool or knife rest; check if machinery equipment is reliably earthed prior to test, to avoid and electric shock due to electric leakage and static electricity of running equipment; make sure thermal treatment and heating furnace are well earthed and metal objects are away from electric parts; once experiment is done, cut off power supply, clean the experiment place, put experiment tools in good order and clean the waste residues and scraps generated by machinery equipment.	
11.2.2	Check if experimenters are provided with personal protection when handling the machinery equipment	Wear working clothes, googles, fasten the gussets, tie up the long hair and wear helmets before operating high-speed cutting machinery. Never wear ornament such as gloves, long scarf, tie and bracket and never wear the slippers or high-heeled shoes in workplace; never adjust the running equipment manually; never put any part of body into the high-risk area; do not adjust the machinery equipment unless it is stopped.	
11.2.3	Check if casting and heat treatment experiments conform to the requirements of	The casting laboratory should have wide space and smooth channel, and wear PPE prior to the experiment; the parts to be heated in salt-bath furnace must be firstly	

S/N	Check Item	Check Points	Records
	experiment place and protection	prebaked, firmly bound using iron wire and slowly put into the furnace to avoid an injury due to splashing of salt solution; the oil-quenching tank should have sufficient oil and stay away from water to avoid a fire; all tools with contact to molten iron must be preheated prior to use, and it is forbidden to put cold tool into molten iron directly to avoid explosion; the forging and pressing equipment should be free from no-load beating or excessive beating of thin forge pieces; the forge piece should be over 850℃ during forging and idled forging hammer should be padded with a wood brick.	
11.2.4	Check if working aloft conforms to the SOP	Wear antiskid shoes and use safety belt before working at edge or climbing at places above 2 m and safety operation regulations should be available.	
11.3	**Electrical Safety**		
11.3.1	Check if electrical equipment is used according to electrical safety specification	Key points: The rated current of fuse (tube) of electrical equipment should be matched with the load capacity of electrical equipment, and do not replace the fuse (plate) with other metal wire; the electrical equipment and wires should be kept dry to avoid fire or burning due to a short circuit; the functional rooms in laboratories should be provided with specific earthing bars on the wall and be provided with multipoint earthing leading-out terminal; the strong-current laboratories with high voltage and current should be provided with safe distance, safety warning board, safety signal lamp, linkage alarm, door lock or shielding barrier (made of metal, earthed reliably, with the height not below 2 m) as specified; the control room (console) should be paved with rubber and insulation pad; the high-current laboratories should be free from inflammables, explosives and corrosives and be provided with ventilation and heat dissipation; the light should be drawn out from upper end of main valve; dry powder extinguisher, yellow sand box and shovel must be prepared; a specific earthing system should be prepared for releasing the residual current of lighting; it is forbidden to use electric tool in the environment which is full of inflammable gas; the electric soldering iron should be stored at the specific shelf; cut off power immediately after use of electrical equipment; the strong magnetic devices should be provided with metal	

S/N	Check Item	Check Points	Records
		screens that are connected to ground.	
11.3.2	Check if electrical equipment is provided with proper protective devices	Strong-current experiment must be conducted by over 2 operators simultaneously wearing insulated gloves; keep air wet, wear anti-static clothes and shoes in the anti-static places; it is forbidden to wear chemical fiber clothes.	
11.4	**Laser Safety**		
11.4.1	Check if safety shielding facilities are equipped in laser experiment laboratories	The high-current laser device should be provided with interlock device and protective cover; do not make laser radiation face personnel to avoid injury and do not uplift the laser emission port and reflecting error.	
11.4.2	Check if PPE are worn properly during laser experiment	Operators should wear PPE such as goggles and avoid use of reflective objects such as watch; do not look at the laser beam and its reflected beam, or have visual collimation to the laser devices; do not check the fault of laser device with eyes and make sure to cut off power supply before inspection of laser device.	
11.5	**Dust Safety**		
11.5.1	Check if explosion-proof electrical equipment is used in places where great amount of powders are stored and used	Explosion-proof lamps and electrical switches should be used; the conductors should be paved in galvanized tubes or water gas tubes to satisfy the overall requirements of explosion prevention; the dust catcher should be used in dust processing, conform to the anti-static and safety requirements and be equipped with explosion arrestment, isolation and venting devices; the tools used should be resistant to explosion or free from sparks.	
11.5.2	Check if PPE is worn properly in experiment places where dusts are generated	Wear anti-static cotton clothes, instead of chemical fiber clothes, in the places of dust; wear dust mask and ear protector when working in the places of dust.	
11.5.3	Check if dust concentration of laboratories is below explosion limit and proper firefighting equipment is prepared	It is forbidden to use dry powder, water-based or foam extinguisher; humidifying device (mist spray) should be installed in the places with high dust concentration, in order to keep the humidity above 65%	
12	**Special Equipment and Conventional Heating/Cooling Equipment**		

S/N	Check Item	Check Points	Records
12.1	**Lifting Equipment**		
12.1.1	Check if *Registration Certificate for Use of Special Equipment* is acquired before using the equipment with rated load lifting capacity above the specified value	The *Registration Certificate for Use of Special Equipment* must be acquired if hoisting equipment has a rated load lifting capacity ≥ 3 t and lifting height is ≥ 2 m; this certificate can be omitted if the equipment is lower than the rated limit.	
12.1.2	Check if the operators and inspection institutions of hoisting machinery are certified	Operators must acquire *Certificate for Special Equipment Operator* and be certified before work, and should receive review in every 4 years; qualified institution should be entrusted to carry out regular inspection and quality certificate of such inspection should be placed at the conspicuous position of special equipment.	
12.1.3	Check if hoisting machinery is given regular maintenance, provided with warning mark and installed with protection facilities	Do monthly maintenance and self-inspection to hoisting machinery and keep records; establish safety operation procedure, post the warning marks at the conspicuous position and establish necessary protection measures; the audible and visual alarm of hoisting equipment should be normal and indoor hoisting equipment should be marked with the operation channel.	
12.2	**Pressure Container**		
12.2.1	Check if pressure containers are provided with *Registration Certificate for Use of Special Equipment* and *Registration Card of Pressure Container* as specified	The pressure containers with pressure over 0.1 MPa and volume above 30 L must acquire the *Registration Certificate for Use of Special Equipment* and *Registration Card of Pressure Container*, which, however, can be omitted if it is a simple pressure container according to introduction on equipment nameplate.	
12.2.2	Check if operators and inspection institution of pressure containers are qualified	Operators must acquire *Certificate for Special Equipment Operator* and be certified before work, and should receive review in every 4 years; qualified institution should be entrusted to carry out regular inspection and quality certificate of such inspection should be placed at the conspicuous position of special equipment; accessories such as safety valve and pressure gauge should be regularly inspected or calibrated by a qualified institution.	
12.2.3	Check if pressure containers are stored at reasonable area and provided with safety	The storage places for large experiment gas cylinders should be ventilated, dry, resistant to rain (snow), water and sunlight, and stay away from open fire and other	

S/N	Check Item	Check Points	Records
	warning marks	heat sources; large cylinders containing experiment gas (asphyxiant and inflammable gas) must be placed outdoors, surrounded by isolating devices and provided with safety warning marks; the cylinders of inflammable gas should stay away from source of fire and heat.	
12.2.4	Check if cylinders for inflammable & explosive gases conform to the explosion-proof requirements	The electric switches and fuses of containers should be set at the conspicuous position and lightning arrester should be installed; check if electrical facilities are explosion-proof and lightning arrester is earthed.	
12.2.5	Check if pressure containers are provided with specific management system and SOP and registered when using	Establish management system and SOP for large gas cylinders, implement the responsibility system of maintenance and safety; carry out registration system and fill out the "Registration Table for Use" in time; inspect the exterior coating, corrosion, deformation, wear, crack of large gas cylinders and check if the accessories are complete and intact.	
12.3	**Specific Motor Vehicles of Site (Factory)**		
12.3.1	Check if *Report for Supervision and Inspection of In-Plant Motor Vehicles* is acquired		
12.3.2	Check if operator has acquired *Certificate for Special Equipment Operator* and becomes certified before work	Check if certificate is valid	
12.3.3	Check if a qualified institution is entrusted to do regular inspection	Check if quality certificate is valid	
12.4	**Management of Heating/Cooling Device**		
12.4.1	Check if the refrigerators for storing hazardous chemicals conform to the explosion-proof requirements	The refrigerators which is explosion-resistant or become explosion-resistant through transformation should be used for storing hazardous chemicals; it is forbidden to use the frost-free refrigerator to store the inflammable & explosive reagent, or use non explosion-proof refrigerator to store the inflammable & explosive chemicals; the refrigerator door should be marked.	

S/N	Check Item	Check Points	Records
12.4.2	Check if substances stored in refrigerator are clearly marked and reagents are sealed reliably	Contents of mark should include: Product name, user and date, and refrigerator should be cleaned on a regular basis; the opening of reagent bottle should be fastened and no open container is allowed; it is not allowed to put foods in the refrigerators of laboratories.	
12.4.3	Check if refrigerator, oven and resistance furnace conform to the requirements of operation period and space	Unless otherwise permitted, the refrigerators beyond warranty period should be no longer used (operation period is 10 years in general); sufficient spaces should be reserved around the refrigerator and do not stack impurities around it to avoid cooling effects; unless otherwise permitted, the oven and resistance furnace beyond warranty period should be no longer used (operation period is 12 years in general); the heating equipment should be placed at the ventilated and dry places, not directly placed on the inflammable products such as wooden desk and board, be reserved with cooling spaces around it; do not place inflammable & explosive chemicals, gas cylinders, refrigerators and impurities onto the heating equipment.	
12.4.4	Check if SOP is prepared for the use of heating equipment such as oven and resistance furnace	The heating equipment should be pasted with warning mark of “Hot” at the conspicuous position, be provided with protective measures, and pasted with SOP and warning marks; it is not allowed to bake inflammable & explosive reagents and inflammables in the heating equipment; do not bake the experiment items in heating equipment if such items are placed in an inflammable container such as plastic basket; after use of heating equipment, clean the items, cut off power supply and make sure it is cooled to the safe temperature before leaving; heating equipment such as oven and resistance furnace should not be used unless it is monitored by operator (in every 10 – 15 min) or provided with real-time monitoring; the oven and resistance furnace in use should be marked with the name of user.	
12.4.5	Check if safety protection measures are prepared for flame furnace or electric hair drier	It is not allowed to use a flame furnace in the laboratories that contain chemicals; if inevitable, establish safety measures and get permit of safety management department of institutions before use; the flame furnace under licensed use should stay away from inflammables and be provided with firefighting facilities, such as fire extinguisher and	

S/N	Check Item	Check Points	Records
		sand bucket; do not use a flame furnace to heat the inflammable & explosive reagent; timely unplug the power socket after use of flame furnace, electric hair drier and electric heat gun; the self-made infrared lamp oven should not be made of paper of wood.	