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Strengthening the Safety Management Strategy of Dangerous Chemicals in University Laboratories

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ABSTRACT. *In recent years, safety accidents such as explosions, fires, and poisonous gas leaks have occurred in the national laboratory of hazardous chemicals in colleges and universities, which has aroused widespread concern in the society. Based on the author's practical experience in laboratory safety management, this paper analyzes the various problems in the laboratory of hazardous chemicals in colleges and universities at this stage, focusing on how to strengthen the dangerous chemicals in colleges and universities from the aspects of laboratory safety system improvement and personnel training management. Feasibility recommendations for laboratory safety management.*

Keywords: *university laboratory; hazardous chemicals; safety management*

0. Introduction

The laboratory of dangerous chemicals in colleges and universities is an important venue for teaching and research. Teaching in the important part of cultivating students' practical ability and innovative ability is also generally carried out in the laboratory. In the process of experimental teaching and scientific research, college teachers and students will definitely be exposed to a variety of chemical reagents and hazardous chemicals. In recent years, safety accidents in chemical laboratories in colleges and universities have occurred from time to time. How can we avoid chemical safety hazards caused by chemical experiments while ensuring the normal safety of teachers and students, and ensure the normal teaching of schools? In order to better play the role of the laboratory, it is a problem that all

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colleges and universities generally pay attention to and pay attention to.

1. Status of management of hazardous chemicals in university laboratories

1.1 Management mechanism is not standardized and needs to be improved

Although some colleges and universities have developed many related systems for laboratory safety management, the safety management systems that have been developed only work on the surface, and there are no specific procedures for many operating procedures, emergency plans and rescue measures. Operational norms, management system is not reasonable enough and normative. On the other hand, some chemistry laboratories do not pay much attention to the management of teachers and students, which leads to confusion in safety management and weak enforcement of the system. Although many laboratories have a safety management system attached to the wall, the experimental teachers and students have not implemented these systems, or have not increased the dosage of reagents according to the requirements of the standard experimental operation. Even some college laboratories have no specialization. The person in charge of security[1]. The safety management of hazardous chemicals in university laboratories has problems of unregulated management methods, single daily management methods, and unsound regulatory systems. Relevant regulatory agencies and school gates fail to understand the actual storage of dangerous chemicals in a timely manner, and safety management cannot Effectively implemented.

1.2 Experimental staff lacks safety awareness

The safety management of hazardous chemicals in laboratories is a complex and comprehensive work, which requires the cooperation of teachers and students and laboratory managers who are engaged in experiments. Their safety awareness and safety knowledge are directly related to the quality of the laboratory management. The relevant personnel of the experiment are mainly the teachers and students of the experiment and the laboratory management personnel. If these teachers and students do not establish risk awareness and do not have the skills to prevent risks, such as when a safety incident occurs, they do not know how to take effective measures,

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which will lead to more serious consequences. However, some university laboratories are only in the form of safety management of hazardous chemicals, which have not attracted enough attention. The content of their management is limited to the conventional safety management regulations and related reminders, and no specific measures are made for hazardous chemicals. The normative management rules do not strictly implement management security duties. The experimenter has insufficient understanding of the dangers of dangerous chemicals, and has little understanding of relevant safety precautions. He has no sense of responsibility for the safety of himself or others.

2. Identification of common hazardous chemicals in university laboratories

(1) Flammable and explosive chemicals. The characteristics of easy-to-explode chemicals are explosive under the conditions of vibration, impact, high temperature, etc., such as nitric acid, potassium citrate, calcium citrate, zinc powder, 30% hydrogen peroxide. These chemicals should be toxic when inhaled, orally or in contact with skin. Wear gloves when using them. If they are inadvertently contacted with skin, they should be rinsed immediately with a specified amount of liquid and must be removed properly after use[2].

(2) Precursor chemicals. The characteristics of precursor chemicals are chemicals that are corrosive, easy to make and so on, and lurking in the process of storage and use, such as sulfuric acid, hydrochloric acid, anhydrous ether, toluene, acetone, potassium permanganate. Wait.

(3) Flammable chemicals. The characteristics of flammable chemical reagents are volatile. When exposed to open flames, their mixture of steam and air reaches the explosion limit. Explosion can occur in open flames and sparks, such as absolute ethanol, ethyl acetate, liquid paraffin, toluene. Wait.

(4) Corrosive chemicals. Corrosive chemicals can cause serious damage to biological tissues when contacted or seriously damage the vehicle during leakage. They can be stored in glass containers with corrosion resistance, such as sodium hydroxide, potassium hydroxide, formaldehyde etc.

3. Suggestions on strengthening safety management of hazardous chemicals in

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university laboratories

3.1 Establish a safety management system for hazardous chemicals laboratory

The management of hazardous chemicals in university laboratories must be based on a sound system. Each laboratory may formulate a "safety management system for hazardous chemicals laboratories" in accordance with the requirements of relevant laws and regulations such as "Laboratory Procedures for Higher Education Institutions", "Regulations on the Safety Management of Dangerous Chemicals" and its actual conditions. These systems must make strict and detailed regulations on the procurement, storage, operation and disposal of hazardous chemicals, and the division of responsible entities in management work. In addition, it is necessary to make clear regulations on the handling methods and emergency plans for dangerous accidents, so that the specific work involving hazardous chemicals can be ruled out, so that the management of the laboratory is scientific and reasonable. The specification is rigorous[3].

Safety work is the basic guarantee for scientific research and experimental teaching in chemical laboratories. The management of the laboratory requires a firm establishment of the concept of "safety first". This requires all personnel entering the chemical laboratory to comply with the laboratory's safety regulations, instrumentation procedures, and how to use fire protection equipment. The rules and regulations require that everyone should know what to do; the laboratory safety management work must implement the post responsibility system. It is necessary to have safety professionals, special personnel management, and special personnel responsible for the management rules of the laboratories in the laboratory; safety technical supervision, inspection and guidance duties, and inspection of the use of various hazardous chemicals should be carried out in the management work. If there are insecure factors, they should be reported in time. In short, the safety management of laboratories must establish sound regulations, safety rules, and strengthen safety precautions.

3.2 Improve the safety management team

Establishing and improving a reliable laboratory safety management team is an

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important aspect in addition to institutional safeguards. It is required to improve the professional quality of the laboratory management team. The professionalism of managers is to determine the quality of safety management. Therefore, it is necessary to increase the training of the management team and further improve their professional quality[4]. The manager is the responsible party of the laboratory safety management work. The implementation of various safety rules and regulations requires a human-based approach. It is imperative to implement responsibility to individuals at every stage of management, or even every step of the process, that is, to implement the safety management system. Relevant teachers and students should raise awareness of safety and prevent the concept of safety first. In addition to the need to carefully study the national laws and regulations related to hazardous chemicals, we must also have a thorough understanding of the knowledge of hazardous chemicals that may be exposed, and learn to standardize the correct operation and use process.

3.3 Implementation of safety management details of hazardous chemicals

In order to scientifically, regulate and efficiently manage dangerous chemicals in university laboratories, it is the key to safety management to establish and improve the rules and regulations governing the purchase, use, storage and disposal. The procurement process requires a standardized operation. Before the procurement, the laboratory personnel need to fill out the application form for the application of hazardous chemicals. After the examination and approval of the laboratory director, the laboratory management department and the leaders of the college sign and agree, and then the purchase is organized by the purchasing personnel. For the storage of hazardous chemicals, they must first be stored in different counters according to their different characteristics. During the storage process, managers are required to periodically check for abnormal conditions. In order to ensure the safety of entry and exit of hazardous chemicals, it is required to implement the “five-double” management system, that is, double-door, double-lock, double-operate, double-check, and two-book records. Disposal of hazardous chemicals must be carried out in accordance with the relevant provisions of the State Law on the Prevention and Control of Environmental Pollution by Solid Wastes, and must not be discharged without treatment, thus causing pollution to the environment.

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Containers, metamaterials, waste residues and waste water of highly toxic substances should be properly disposed of[5].

3.4 Establish a scientific and effective emergency response plan

Each hazardous chemicals laboratory shall formulate management system rules such as “fire accident emergency plan”, “poisoning emergency response plan”, “explosive accident emergency plan” and “chemical reagent accident plan”. The laboratory is a relatively closed space, which is very likely to cause unknown and sudden dangerous accidents. In the event of such an emergency, it is first necessary to ensure that the relevant personnel of the experiment can take the correct treatment to ensure the safety of the teachers and students.

4. Conclusion

Further improve and improve the safety management of university laboratories, formulate strict and standardized operational and safety management rules for the requirements of the laboratory of such hazardous chemicals, and establish a sound supervision system and a reasonable safety management access system. The purpose is to push the laboratory safety management to a more standardized and standardized direction.

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