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Technical specification of treatment equipment for chemistry laboratory waste water

化学实验室废水处理装置技术规范

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1 Scope

This document specifies the general requirements, unit requirements, treatment and disposal methods, and environmental protection requirements for chemical laboratory wastewater treatment equipment.

This document applies to on-site treatment devices and processes for wastewater generated in chemical laboratories.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB 5085.7 Identification standards for hazardous waste -- General rules

GB 8978 Integrated wastewater discharge standard

GB 18599 Standard for pollution control on the non-hazardous industrial solid waste storage and landfill

JB/T 8938 General specification for sewage treatment equipment

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Chemical laboratory

A place for exploring, researching, experimenting, and testing analysis of chemistry.

3.2 Chemistry laboratory waste water

Waste water from the process of container washing, instrument washing, and cleaning of contaminants.

Note: Excluding waste liquid and hazardous waste.

4 General requirements

4.1 The chemical laboratory waste water treatment device (hereinafter referred to as the "device") shall be equipped with overflow holes, sampling ports, and exhaust holes.

4.2 The device shall be equipped with inspection holes or doors to facilitate inspection and repair.

4.3 The device shall be equipped with an exhaust fan and an exhaust air pipe connection to the outdoors, and a purification device can be installed if necessary.

4.4 The device shall be treated effectively against corrosion and leakage.

4.5 The device shall have sufficient rigidity and strength, and shall meet the requirements of JB/T 8938.

4.6 The device shall be equipped with manual and automatic operation modes and fault alarm facilities. The device's whole process of treating chemical laboratory wastewater (hereinafter referred to as "waste water") shall be fully automatic control.

4.7 Corresponding measures shall be taken during the operation of the device to ensure that liquids such as waste water and chemical liquids do not freeze.

4.8 The device shall operate safely and reliably under normal maintenance and specified conditions of use.

4.9 The main equipment of the device shall be a modular design, and the corresponding processing unit can be selected according to the processing function requirements.

4.10 The device shall have a collection and storage unit.

4.11 The device shall have a sludge collection and dehydration treatment unit.

4.12 The port of the online monitoring unit shall be reserved in the device.

5 Unit requirements

5.1 Collection and storage unit

remove microbial pollutants.

6.2 Process flow

6.2.1 The waste water is discharged to the waste water collection tank. When the liquid level in the collection tank reaches the set level, the system automatically starts to process it.

6.2.2 The waste water is transferred to the pH adjustment tank by the pump. The acid or lye is automatically added by the automatic dosing device to adjust the pH value, then to remove acid and alkali pollution. During the dosing process, aeration stirring or mechanical stirring shall work to stir the liquid well.

6.2.3 The neutralized waste water enters the coagulation-sedimentation tank. When heavy metal ions need to be processed, the heavy metal trapping agent is automatically added by the automatic dosing device to remove heavy metal ions. Add flocculants or coagulants to coagulate-settle the suspended solids and colloidal substances in the waste water.

6.2.4 After the waste water is coagulated-settled, the organic pollutants in the non-biodegradable treated waste water are degraded by oxidant oxidation or advanced oxidation; the organic pollutants in the biodegradable treated waste water are degraded by biochemical methods. Then, the effluent is passed through the membrane separation system of the membrane bioreactor (MBR) or the secondary sedimentation tank for mud-water separation.

6.2.5 After the oxidation and biochemistry treatment, the waste water is filtered through adsorption to remove residual pollutants. It may continue to treat it by membrane filtration, to make the effluent meet higher standards.

6.2.6 After disinfection, the waste water can reach the standards and be discharged.

6.2.7 The sludge generated by the coagulation-sedimentation unit, the oxidation unit, and the biochemical unit is regularly transferred to the sludge filtration and dewatering device by the sludge pump. After the filtration and dehydration treatment, the liquid generated by dehydration treatment is returned to the waste water collection tank.

6.3 Process flow diagram

The chemical laboratory waste water treatment process is shown in Figure 1.

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