Present Situation and Evaluation of Contaminated Soil Disposal Technique

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Abstract. In recent years, because of the abuse of pesticides and fertilizers and the random discharge of sewage, the soil pollution is becoming more and more serious. At present, China's soil environment is grim. The treatment of contaminated soil is the focus of current research in agriculture, environment and ecology. Because of the different types of soil pollution and soil properties, and the complex process of contaminated soil, many factors need to be considered. Common soil remediation techniques include: Chemical remediation, bioremediation technology. The bioremediation technologies include: animal remediation technology, phytoremediation technology and microbial remediation technology. Animal remediation technology is the use of lower animals in the soil metabolic activity degradation of organic pollutants in soil conversion. Phytoremediation technology refers to the absorption, enrichment, degradation, transformation of soil contaminants, to achieve the purpose of soil control. At present, phytoremediation technology has been widely used, which can effectively control heavy metal contaminated soil. Microbial remediation technology is the use of soil microbial metabolic activity of the soil in the degradation of pollutants into non-toxic substances.

1. Introduction
In recent years, with the acceleration of industrialization in China, environmental pollution has become increasingly serious. The abuse of chemical fertilizers and pesticides, the random discharge of sewage and the unreasonable land development have caused soil pollution, and the pollution area has been increasing year by year. Land pollution is diversified and long-term, and there are many types of land pollution, including pesticide pollution, metal pollution and organic pollution. Compared with water pollution and air pollution, soil pollution is more hidden, and the purification ability of the soil itself is poor, these factors increase the difficulty of repairing contaminated soil. To alleviate the situation of soil pollution in China, we should adopt effective measures to actively control the soil pollution. However, in the process of soil pollution control, various factors should be taken into account to avoid the expense of some of the environment at the expense of soil management. At the same time, we need to uphold the concept of "green sustainable restoration" to reduce the secondary pollution of the environment in the process of soil remediation. This paper describes the status of contaminated soil disposal technology and evaluation.

2. Chemical Remediation
Soil remediation is a complex and tortuous process. In China, soil remediation is facing many problems. Traditional soil remediation techniques are chemical / physical remediation techniques. The so-called chemical repair technology refers to the soil by changing or destruction of the chemical properties of pollutants in order to achieve the purpose of repairing the soil. Chemical repair technology mainly rinse repair technology, redox technology.
2.1. Chemical Leaching Repair Technology
Chemical leaching remediation technology is the use of water containing flushing aids or acid/alkaline solution into the contaminated soil, washing soil contaminants, and then dealing with waste liquid containing contaminants.

The key of this technology is to find an economical and practical eluent, not only can effectively remove all forms of pollutants, but also does not destroy the basic physical and chemical properties of soil[1]. In the process of soil remediation, the nature of contaminated soils, the selection of suitable leaching remediation conditions, and the nature of contaminants in the soil are all factors influencing the remediation of chemical leaching. Soil chemical properties such as soil texture, organic matter content and soil particle size distribution affect soil chemical leaching remediation techniques. Proper chemical leaching repairing operation conditions can not only achieve the purpose of soil remediation, but also reduce economic costs and minimize secondary pollution.

Sun et al. studied the effects of different eluents on heavy metal contaminated soils under different leaching conditions and summarized the leaching effects of different eluents on heavy metals in different forms[2]. It was pointed out that the natural organic acids have high degradation and low ecological toxicity, so they are the most promising. The results show that the use of highly efficient eluent and the selection of suitable process conditions can lead to the remediation of polluted soil, increase the economic benefit and reduce the secondary pollution to the soil.

2.2. Chemical Oxidation Reduction Technology
Chemical oxidation and reduction technology is to put the soil through the chemical oxidant or reducing agent, so that the soil with the chemical reaction of pollutants in order to achieve the purpose of repairing the soil[3]. The chemical oxidation process breaks down the chemical structure of the contaminants in the soil by utilizing the oxidation function of the oxidant, so that pollutants into low-... pollutants sensitive to the use of chemical reduction technology to repair is the current research focus. For example, in the repair of chromium-contaminated groundwater system by the process, the hexavalent chromium is reduced to trivalent chromium, so as to achieve the purpose of repair. At present, there are some problems in the degradation of chlorine-containing organic compounds by the dechlorination property of zero-valent iron, such as passivation of iron surface activity and polymerization failure due to adsorption of soil [4]. In order to avoid these problems New catalysts and surface activation technologies are required. For groundwater and soil contaminated by contaminants at the same time can take this technology to repair.

3. Bioremediation Technology
The use of chemical / physical remediation techniques to treat large areas of soil pollution is difficult. And for large areas of soil pollution if blindly to the traditional repair technology, the resulting secondary pollution may be far more than the pollution of the soil itself hazards. In this case bioremediation can be used. Compared with the traditional method, the bioremediation technology has the advantages of simple operation, low investment, high efficiency, good effect and environmental safety. Biological methods can be divided into animal remediation, phytoremediation, microbial remediation and bioremediation [5].

3.1. Animal Repair Technology
Animal remediation technology uses low-grade animals In the soil (Such as the use of earthworms, crab, filter-feeding shellfish, etc.)and their own microbial metabolism in vivo, transformation and degradation of soil contaminants, thereby repairing the soil. Zhou et al found in the study by the interaction of bacterial nematodes and micro-organisms can be achieved in the degradation of contaminated soil prometryne effect. But it has its own limitations. At present, there are few reports on the research of animal remediation technology, and the research on the treatment of heavy metal contaminated soil by using lower animals in soil is still in the exploratory stage.

3.2. Phytoremediation Technology
Phytoremediation uses plants' normal metabolic activities to absorb, enrich, and accumulate, and to degrade soil contaminants, thereby repairing contaminated soils. The remediation ability of each plant
is different for polluted soils, so there are some differences in the remediation methods for different contaminated soils. In recent years, Chinese researchers have found more than 300 kinds of plants that can enrich heavy metals such as copper, arsenic and nickel. Therefore, in practical application should be fully aware of the repair capacity of each plant in order to select the appropriate plant to repair the soil, to remove soil contaminants. At present, in the process of remediation of heavy metal contaminated soil by phytoremediation, the focus is to discover the plants that can be used to repair heavy metal contaminated soils, the mechanism of plant enrichment and the factors influencing plant uptake and enrichment characteristics. In addition, plants can be used to repair organic contaminated soils.

3.3. Microbial Remediation Technology
Microbial remediation technology through the use of microbial metabolic functions, degradation of soil contaminants. So as to achieve the purpose of repairing the soil. In the natural environment, there are many microorganisms in the soil, they can automatically degrade soil contaminants, but in recent years due to human abuse of pesticides and chemical fertilizers, destroying the automatic degradation of microorganisms. At present people through artificial cultivation technology, the use of microbial remediation of contaminated soil.

3.4. Combined Bioremediation Technology
The combined bioremediation technique utilizes two or more of the above methods to repair contaminated soil. One of the most commonly used is the combination of plant and microbial bioremediation technology. It is the use of plant and microbial complex system of absorption, collation, degradation of organic matter in the soil, plant repair and microbial repair can be organically combined. Plant and microbial remediation technology mechanism is the use of the plant's own metabolic process to absorb organic pollutants in the soil and accumulate, plant-generated secretions or enzymes can soil organic pollutants degradation, soil microbial own Metabolic activities can effectively degrade organic contaminants in soil.

4. Summary
Chemical remediation technology developed earlier, for pollution of soil, chemical repair technology has quick, short repair time advantage. However, there are some disadvantages such as high cost, high energy consumption and secondary pollution, so it is not suitable for treating large area soil pollution. In recent years, the rapid development of bioremediation technology, in which phytoremediation and microbial remediation development of the most rapid. Phytoremediation technology is a low cost, environmentally safe and easy to produce secondary pollution remediation of soil methods, and has become a major technology to repair soil heavy metal pollution. Soil microorganisms can use their metabolic activities to degrade organic pollutants in the soil into harmless substances. Based on this principle, the soil microorganisms can be widely used in the remediation of soil organic contaminants. In short, compared with the traditional chemical repair technology, microbial remediation technology with low consumption, high efficiency, pure ecology, easy management and other advantages, has good prospects for development.

Traditional soil remediation techniques should be taken to avoid soil treatment at the expense of certain environments. In order to remediate contaminated soil, we need to uphold the concept of "green sustainable restoration", which needs to be considered in the remediation of contaminated soils. In addition soil pollution and groundwater pollution are closely linked, so in the repair of contaminated soil at the same time should avoid secondary pollution of groundwater.

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