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Humic Mechanism and Resource of Municipal Sludge Based on Aerobic Digestion

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Abstract: At present, the reasonable disposal and control of municipal sludge in China has just started, and the treatment method is still relatively backward, which is more likely to cause secondary pollution. Therefore, the use of sludge batch aerobic humification treatment is a relatively advanced technology worth carrying out Promotion. It is also very urgent to recycle municipal sludge. This article aims to study the working mechanism of municipal sludge humification based on aerobic digestion and its resource research. This article uses a variety of survey methods to investigate and compare the sludge treatment methods of a city for 5 consecutive years and compare their resource utilization rates; the frequency and current use of aerobic humification sludge treatment methods at 3 major municipal sludge treatment plants in a province Existing difficulties; literature analysis summarizes the mechanism of aerobic digestion of municipal sludge humification method; resource conversion of aerobic humification sludge treatment method of three major municipal sludge treatment plants in a province is obtained in four aspects in conclusion. The results show that the use ratio of aerobic humic sludge treatment is increasing year by year, and its use ratio is about 30%, and the resource conversion rate is about 60%, which can reduce the proportion of harmful substances to about 3%. The main occurrence conditions are the oxygen index is higher than 50%, the temperature is 100-70 degrees, the C / N ratio is 1: 3, and the water content is greater than 75%. The current difficulty is mainly the difficulty in determining the degree of fermentation maturity. Both. The results fully prove that people are more and more aware of the importance of aerobic humus in the municipal sludge treatment process. Among them, aerobic humus is conducive to improving resource utilization and reducing emissions of harmful substances. The proportion of use is not high, and there are mainly technical problems and dirt classification problems.

1. Introduction

The municipal sludge treatment mainly adopts advanced technology in Europe and America: the humification of sludge in batches. This technology uses its main technical means to plant some specific plants that can help form some types of soil ecological environment. The metabolic action

of microscopic and macroscopic organisms forms the decomposition process of organic matter. In this process, the sludge moisture is partially removed, the organic matter is largely degraded, and the number of pathogens and parasites is greatly reduced. This process can be regarded as the process of composting Humic stage. When the surface vegetation is fully mature, after the sludge of the first layer is completely humified, the second layer of sludge to be treated is filled in the treatment site. Then proceed to the second part of the process. In this way, some harmful substances are alleviated step by step, so as to achieve the final purification of sludge, and a large amount of harmful substances are degraded. More than a dozen large-scale treatment plants have been built around the world and have achieved success. After more than ten years of practical exploration, the technology of plant grass batch humification sludge treatment is very mature and can be widely promoted, which is very beneficial to our country.

As modern people's concern about the protection of human living environment and the improvement of social improvement and environmental protection awareness have also increased, more and more industrial sludge treatment wastewater is beginning to be treated. Combined with a large amount of industry information analysis data, we can predict sewage treatment after many years The average annual production of sludge will likely reach 60 million tons per year for the first time, and wastewater sludge is an inevitable natural product in this process [1-2]. If an efficient and comprehensive treatment of industrial sludge treatment is not possible, it will inevitably pose a certain social threat to the healthy and harmonious development of economic society. The overall water content and main organic content of wastewater sludge produced by Zhengzhou sewage sludge treatment plant in towns are relatively high. The organic part may contain various harmful bacteria, viruses and various parasites, which are easy to rot and smell ; May also contain a large amount of copper, zinc, lead and cadmium and heavy metals and other compounds, if not properly handled in time, it will cause serious secondary pollution to the environment. Therefore, it is urgent to deal with the problem of sewage sludge pollution in the community sewage pond [3-4].

Rossi G and other scholars have found that the organic components of sewage sludge in agricultural soil can help slow down the loss of soil organic carbon, and in some cases can also improve the physical and mechanical properties of the soil. The heavy metal content of sludge is one of the main factors restricting the agricultural utilization of sludge. In the long run, the application of agricultural sludge can increase the concentration of heavy metals (total effective components and biologically effective components) in the soil. The purpose of the research by Rossi G and other scholars is to evaluate the effects of mid-term fertilization of sewage sludge of different treatments on soil organic carbon content and humification-mineralization process, the impact on soil physical and mechanical properties and its potential for bioavailable heavy metal pools Impact to assess its effectiveness as an organic soil amendment. After eight years of sludge management; the concentration of bioavailable forms has increased in all the analyzed heavy metals; it has nothing to do with the type of sludge. The form of sludge treatment (liquid, dehydration, composting) has different effects on the soil humification-mineralization process and soil physical-mechanical properties. The long-term improvement of compost sludge is beneficial to maintain the balance of soil humification-mineralization process and improve the physical and mechanical quality of the treated soil [5]. The purpose of experiments by scholars such as Tang J is to improve efficiency and reduce the mobility of heavy metals. They optimized the washing conditions such as concentration, contact time, liquid-solid ratio, and pH. The desorption performance of heavy metals has been rigorously studied. Tang J and other scholars studied the continuous washing steps of heavy metals and the activation of heavy metals. The results showed that the total content and components of heavy metals reached significant extraction efficiency.

After three washings, the extraction efficiency of Cr was the highest (65.00%). The highest exchange rate (85.00%). In addition, the heavy metal binding strength and mobility were also studied. The results showed that the heavy metal binding strength (IR) increased after washing, while the weak components extracted by saponin decreased the mobility (MF). Toxicity characteristic leaching process (TCLP) shows that heavy metals have relatively stable components in the sludge after washing [6].

Based on the above theoretical research, this article aims to study the mechanism and resource of municipal sludge humification based on aerobic digestion. Through a variety of survey methods, this paper found that the use rate of aerobic humification has increased year by year, and its use rate is about 30%, and the resource conversion rate is about 60%, which can reduce the proportion of harmful substances to about 3%, which mainly occurs The condition is that the oxygen index is higher than 50%, the temperature is 100-70 degrees, the C / N ratio is 1: 3, the water content is greater than 75%, the previous difficulties are mainly the difficulty in determining the degree of fermentation maturity, non-degradable substances and pollution Unequal classification. It fully proves that people are more and more aware of the importance of aerobic humus in the process of municipal sludge treatment. Among them, aerobic humus is conducive to improving the utilization rate of resources and reducing the emission of harmful substances, but the current use of aerobic humification methods the proportion is not high, and there are mainly technical problems and dirt classification problems.

2. Proposed Method

2.1. The Principle and Classification of Municipal Sludge Humification

(1) Definition and process of aerobic digestion sludge humification

Municipal wastewater sludge treatment Humic water digestion is mainly used for the treatment of oxidized water digestion with benefits[7]. Various organic substances in wastewater treatment and their interaction with salts and enzymes produced by the growth of aerobic anaerobic bacteria can carry out biochemical chemical reactions. Organic substances and their salts such as c, n, p, s and other chemical elements are The bacteria are transformed or oxidized by enzymes to produce salts such as co2, nh3, nitrite, nitrate, sulfate, etc., and a part of them are synthesized into new protoplasts and can provide a large amount of nutrients and minerals for the normal growth and reproduction of aerobic bacteria [8-9]. It is generally applicable to some industrial wastewaters where the discharge concentration of organic matter is not too high, but care must be taken to ensure that enough organic oxygen is added to ensure that certain organisms have a certain demand for organic oxygen during the oxidation reaction [10-11]. First of all, we have to consider planting some specific wild plants that can effectively help humans form some environment similar to soil type ecological environment [12]. The microbial metabolism and photosynthesis of microorganisms in the biological micro and chemical macro have formed a process of dehydration, decomposition and removal of some important organic substances.During this decomposition process, a large amount of moisture in the soil sludge is largely decomposed and removed, and a large amount of organic matter moisture is obtained. Partial degradation, the number of pathogenic bacteria and other parasitic pests are greatly reduced, this process can be regarded as the humification stage of composting [13]. When the surface vegetation is fully mature, after the first layer of sludge is completely humified, it represents its completion. Fill the treatment site with the second layer of sludge to be treated, and then carry out the second part of the treatment [14].

(2) Types and characteristics of aerobic digestion process

Aerobic digestion of sludge includes two types: normal temperature aerobic digestion and high temperature aerobic digestion (50 ~ 60 ℃). High temperature aerobic digestion technology has been researched and applied more and more because of its good sterilization and disinfection effect. Commonly used sludge aerobic digestion process has the following three types: delayed aeration, sludge aerobic digestion alone and high temperature aerobic digestion. Among the first two methods, the delayed aeration method requires a large increase in the volume of the aeration tank, resulting in a sharp increase in the energy consumption of the sewage plant. It is generally considered to be limited to the use of small sewage plants, and some countries have large sewage treatment plants. This process technology is also used, but from the overall effect, it is difficult to truly ensure the stability of the sludge [15]. The aerobic digestion of sludge alone is also limited to small sewage treatment plants. However, the use of high temperature and aerobic digestion can basically kill pathogenic bacteria, and the degradation efficiency of organic matter in sludge is also high, so it can achieve a high degree of sludge stability, so it is worth promoting [16].

(3) Technical advantages and characteristics of sludge humification

The characteristics of sludge humification treatment technology are different from other sludge treatment technologies, which are composed of the following points:

1) No need to consume any mechanical equipment, energy, electricity and any chemical agents during the process;

2) The treated sludge has no malodorous smell and is similar in appearance to humus-rich soil;

3) The entire treatment process is completely a secondary green ecological environmental protection treatment process. The entire treatment process and the products used will not cause any secondary pollution to any environmental resources;

4) Products-humus-rich sludge can be used for greening gardens, agricultural planting and fertilization. It can not only solve the problem of large amounts of sludge stacking, but also use waste. Turning waste into treasure is very beneficial to ecological protection [17].

2.2. Characteristics of Ecological Protection of Sludge Humification

The cost of stable sludge treatment and disposal is relatively large, which is approximately equal to 30% to 40% of the entire operating investment of the supporting sewage stabilization treatment plant. Therefore, due to the limitations of the amount of international funds and investment capacity, China currently has a stable treatment of supporting sludge and The advanced technology of sewage disposal has just begun. At present, among the existing supporting sewage treatment and disposal facilities in China, only the supporting sludge stabilized sewage treatment and disposal facilities are far less than 1/4 of China's total. The main ways to dispose of sludge are as follows: First, the sludge is digested with water and then dehydrated, then it is sludge to landfill or open fire incineration [18-19]. Although the long-term landfill of sludge is more convenient and economical, at the same time we inevitably need to occupy a large amount of underground land for a long time, and some natural harmful substances in the landfill of soil sludge will also enter the underground soil. Sludge will produce our underground soil environment. Many environmental hazards have buried many hidden dangers for our future agricultural survival and development.Secondly, the sludge will seriously waste some of the material resources in the soil sludge that can be recycled and reused, increasing the potential safety of causing serious pollution to our groundwater soil Risk [20-21]. Although incineration of high-waste sludge can effectively solve the environmental problem that a large amount of incinerated sludge cannot be reasonably stacked, the large amount of white toxic and odorous organic gas discharged from incinerated sludge will cause serious

atmospheric environmental water quality once discharged into the indoor atmosphere. Pollution. On the contrary, it may worsen our natural ecological environment even more seriously. In this way, the gains outweigh the gains [22-23]. How to properly treat sewage sludge and use it as a new resource has become a topic of great concern to the environmental protection community, and has a lot of important issues. Therefore, the introduction of advanced European sludge treatment experience into the country has practical significance for promoting the development of domestic sludge treatment technology. Sludge batch humification treatment technology is a typical one of them. This technology can also be regarded as a kind of technical support for sludge treatment in China, making up some of our technical gaps, this technology will also play a key role in our future development [24].

2.3. Basic Properties of the Determination Method

The sludge is composed of various substances, so the detection will also be carried out in different types and in different ways due to different substances, including physical and chemical index detection, industrial analysis, element analysis, pollutant monitoring and biological detection. Detection [25]. And according to its future professional use will be different detection indicators and evaluation criteria, and it has special detection indicators for testing. Therefore, it must be treated and processed according to its use, usage, and standards. The specific processing flow of sludge is shown in Figure 1.

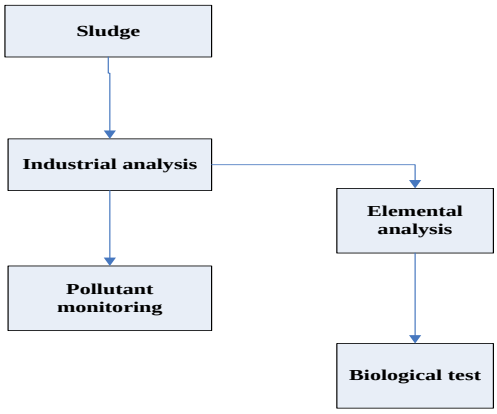

Figure 1: Processing and processing processes

2.4 .Structure of Sludge Treatment System

In recent years, the annual output of special sewage sludge produced by large-scale sewage sludge treatment plants in our cities and towns (hereinafter referred to as our factory for wastewater sludge) has increased rapidly with the rapid and healthy development of our economy and the rapid increase of our population. As a kind of sewage waste that may have huge pollution and harm to environmental substances, how to properly treat and dispose of sludge in sewage has gradually become an environmental safety issue that our public is very concerned about. The following will give me a brief and in-depth summary of the current status of sludge utilization in the reservoir area.

First of all, the comprehensive output of sewage sludge mainly depends on the comprehensive treatment volume of cement and sewage in urban cement and sewage comprehensive treatment plants, and there are still many main factors that directly affect the output of urban cement and sewage comprehensive treatment plants, including the national economy. Many factors such as

development capability and floating population. In recent years, China has completely entered the critical stage of rapid development of modern industrialization and new-type urbanization, and the level of economic and social development capacity has initially been greatly improved. According to statistics from the World Bank, the average annual economic growth rate of China's GDP per capita has reached 9.88% in the past few years. At the same time, with the continuous advancement of China's new urbanization construction process, the total resident population of the city's overall population and the proportion of its population in the total population of China have also increased year by year. At present, the resident population of the entire city of China has reached 862 million, accounting for about 63.6% of the total population of our country, and this population proportion will continue to increase at a rate of 2% per year. According to statistics, from 2010 to 2017, the average annual urban sewage sludge discharge in China, the average annual urban sewage sludge treatment volume, the annual urban sewage treatment rate and the urban sludge treatment output are shown in the statistical table, of which the sewage in the main stream of the Yellow River The output of sludge treatment is calculated based on the average annual solidification coefficient of sewage treatment in Chinese cities of 0.02%. The results of the statistical analysis of the quality of the construction process of sewage sludge treatment plants in sewage sludge treatment plants in urban areas of China are shown in the following table. The results show that most large-scale sewage sludge treatment plants mainly use cement concentrated water and dehydration methods to quickly process a large amount of sludge, but the actual amount of cement sewage treated by stable chemical methods is only less than 20% in the treatment plant. . The sludge and sewage treatment in most large-scale sewage sludge treatment plants is not fully in place or will directly affect the final effective disposal of wastewater sludge to a large extent.

3. Experiments

3.1. Experimental Background

Municipal sludge is a by-product produced during the treatment of municipal sewage by aerobic methods. Under the adsorption of bacterial micelles, the sludge is enriched with a large number of toxic and harmful substances such as organic matter, heavy metals, and pathogenic microorganisms. Direct exposure of untreated sludge will cause serious pollution to the water environment, atmosphere and soil, endanger the health of the surrounding residents, and may even cause serious environmental pollution incidents. In China, the supporting facilities for sludge treatment are not perfect, and the severity of sludge treatment is neglected. The sludge is rich in N, P, K and other nutrients required for plant growth. Through composting, it can effectively kill pathogenic microorganisms, achieve the stabilization of heavy metals, and degrade the concentration of polluting organic matter, which can be applied to garden greening Effectively supplement the organic matter of the soil.

3.2. Experimental Setup

(1) Through data, investigate the sludge treatment method of a city for 5 consecutive years and compare its resource utilization rate;

(2) Investigating the frequency and difficulties of the municipal sludge humification method based on aerobic digestion in 3 major municipal sludge treatment plants in a province

(3) Through literature and analysis of relevant industry personnel, summarize the mechanism of aerobic digestion of municipal sludge humification method;

(4) Investigate the resource conversion of municipal sludge humification based on aerobic digestion at 3 major municipal sludge treatment plants in a province.

3.3 Detection of Sludge Humification Treatment Capacity

Firstly, the organic carbon was determined by potassium dichromate oxidation method, and then the humic acid was grouped and determined

Weigh and sieve 2.0g (with an accuracy of 0.0001 g) of sludge and a pile of corroded samples that have passed the 60 sieve of the project, put them into a 50ml0 centrifuge tube, add 40ml0.1moll-1na2p4o7 and 0.1moll-1naoh to extract the mixture, oscillate for 16h (150rpm) under normal temperature, centrifuge for 20min (4000rpm) after standing, and then filter with 0.45 μ m mixed fiber as the filter membrane, Repeatedly and evenly extract several times until the color of the sample extraction solution is nearly transparent and colorless. The filtrate was collected and the pH value was stabilized to 6.0 by 2moll-1hcl hydraulic regulator, that is, the active humic acid filtrate component (HS). Take 20ml of the above two kinds of humic acid sodium solution and put it into a small beaker, add 2moll-1hcl of water drop by drop into the water until the solution appears acid precipitation, transfer it into a clean hydrochloric acid centrifuge tube, and centrifugate for 20min (4000rpm), the supernatant is the alkali component (FA) of fulvic acid, and the precipitation is the acid component (HA) of humic acid. The above-mentioned precipitate of sodium trichloroaluminate was re centrifuged and dissolved in 0.1moll-1naoh water solution. After centrifugation, the indefinite value dissolved substance was removed, and then the quantitative pH indefinite value concentration regulator of 2moll-1hcloh solution was added to the pH value to 6.0. After centrifugation, the above-mentioned clarified solution was discarded. After sedimentation, the water remained for use. The carbon content of each atomic component is generally determined by the method of peroxide decarburization based on potassium dichromate, calculated as 0.gkg-1.

Then use the color UV spectrum to scan in turn: carry out the spectrum measurement on aatu1810pc uv-color adjustable internal light polymer laser UV photometer in turn, the scanning photometric range is generally 200~700nm, and the average mass radiation concentration of the sample is 100mgl-1. According to the data of wireless spectrum analysis, the ratio of absorption spectrum coefficient of different characteristic ultraviolet rays to e465 / e665 was calculated. Determination of infrared spectrometer: infrared scanning is carried out by using infrared spectrometer of Fourier transform method. After grinding 1mg of freeze-dried test material samples and 400mg of dry pakbrc and other materials, they are evenly mixed. Under the pressure of 20-30mpag, they are pressed into white flakes, and the scanning thickness range is generally 4000-400cm-1.

4. Discussion

4.1. Investigation of Municipal Sludge Treatment Methods and Resource Conversion Rate

By investigating the changes of sludge treatment methods and effective resource conversion rate in a city for five consecutive years, the data are shown in Table 1 and Figure 2. The experimental results show that with the vigorous control and control with the increasing shortage of resources, the use of sanitary landfills and natural air-drying methods has decreased year by year, while the use of aerobic humic methods has increased year by year. At the same time, the ratio of untreated sludge also showed a significant downward trend each year. In line with this performance, its resource conversion rate is increasing year by year, which fully proves that people are increasingly aware of

the importance of the correct treatment of municipal sludge.

Table 1: Investigate the changes of sludge treatment methods and effective resource conversion rate in a city for 5 years

Years	Aerobic humic (%)	Sanitary landfill (%)	Incineration (%)	Natural drying (%)	Untreated sludge (%)	Resource conversion rate (%)
2019	54.3	21.2	19.4	1.9	3.2	89
2018	35.3	34.0	23	2.2	5.5	75
2017	24.5	47.3	18.9	3	6.3	74
2016	14.3	51.8	22.4	4	7	56
2015	9	65	12	5	9	35

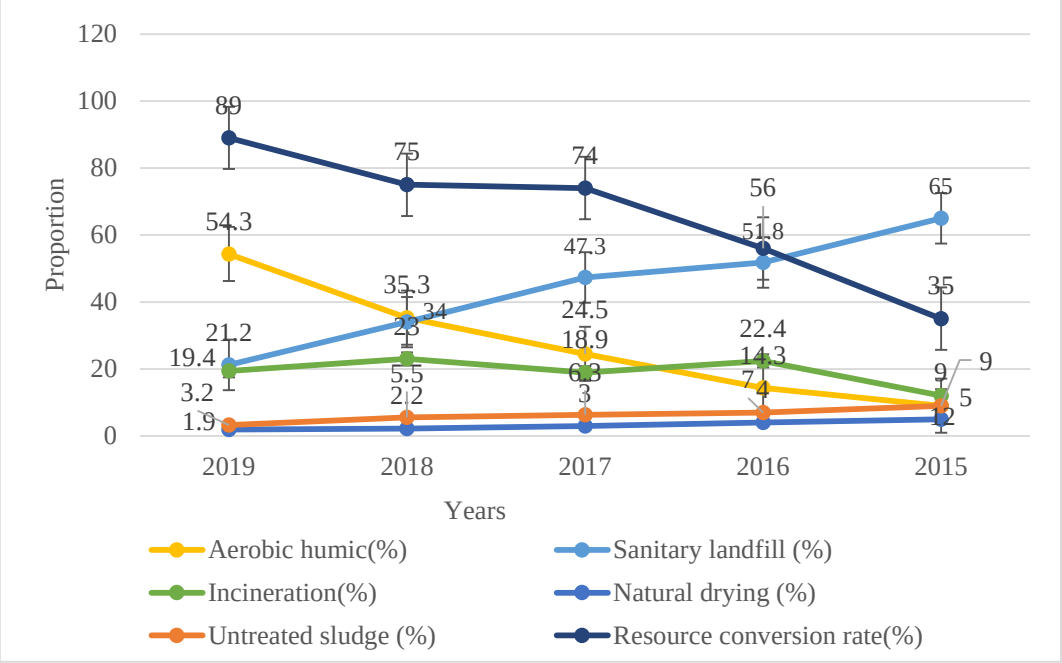

Figure 2: Investigate the changes of sludge treatment methods and effective resource conversion rate in a city for 5 years

4.2. Use Frequency and Difficulties of Municipal Sludge Humification Method Based on Aerobic Digestion in Municipal Sludge Treatment Plant

Investigate three major municipal sludge treatment plants in a province, namely A, B and C. The frequency of aerobic digestion of municipal sludge humification methods and the current difficulties in their use. The survey data is shown in Table 2 and Figure 3. As shown. The results show that the aerobic humification methods used by the three main municipal sludge treatment plants are around 30%. The current difficulties in using the aerobic humic method are mainly about 50% of the difficulty in determining the degree of fermentation maturity, and about 25% each of the non-degradable and non-uniform classification of the dirt, which fully shows that the current aerobic humic method. The ratio is not high, there are mainly technical problems and dirt classification problems.

Table 2: Investigate the proportion and difficulties of aerobic humic methods used in 3 major municipal sludge treatment plants in a province

Municipal Sludge Treatment Plant	Aerobic humic use frequency (%)	Difficult to use		
		Determination of fermentation maturity (%)	Non-degradable substances (%)	Unknown dirt classification (%)
A	35.6	44.0	23.4	32.6
B	24.5	47.3	28.9	23.8
C	34.3	51.8	24.4	23.8

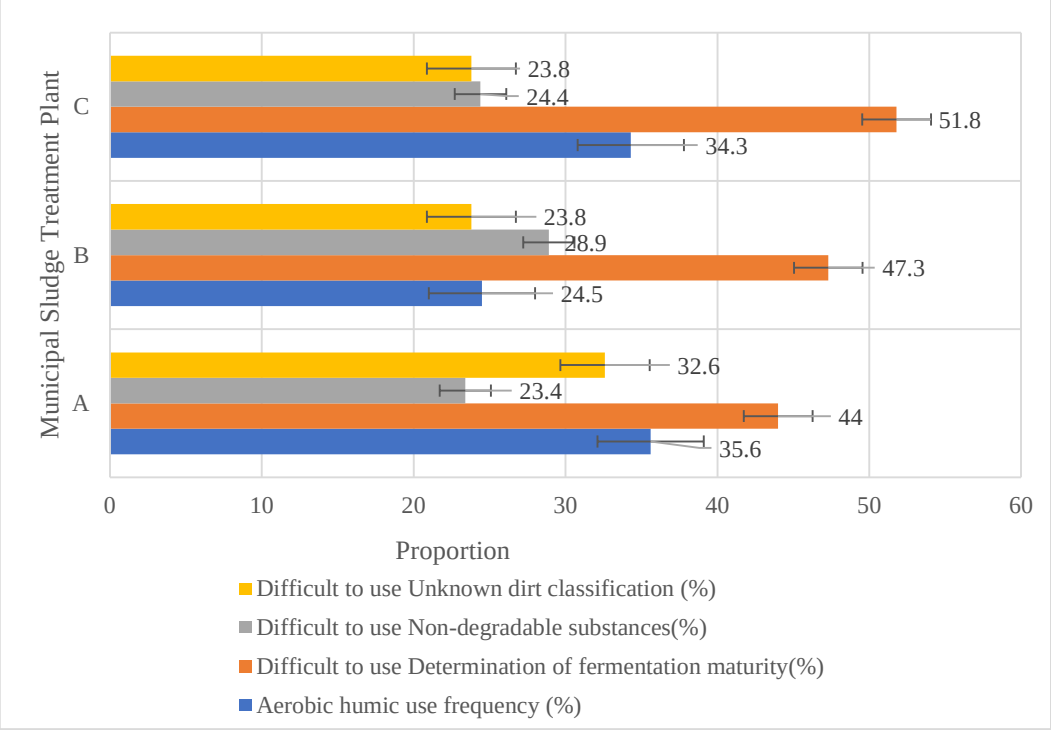

Figure 3: Investigate the proportion and difficulties of aerobic humic methods used in 3 major municipal sludge treatment plants in a province

4.3. Literature Summary and Analysis of the Mechanism of Aerobic Digestion of Municipal Sludge Humification

Through literature survey, it is found that the main sludge treatment processes in China currently include landfill, incineration, aerobic humus and anaerobic digestion. Among them, aerobic humus is currently one of the most suitable sludge disposal methods in China. The process decomposes the macromolecular organic matter in the sludge through the action of microorganisms, thereby realizing the harmlessness and stabilization of the sludge. The process of sludge aerobic humification is mainly to decompose organic matter through the activities of various microorganisms (including bacteria, actinomycetes, fungi and protists). Therefore, in order to ensure the life activities of microorganisms, it is necessary to study and control the important parameters of the humification process. Specific parameters are shown in Table 3 and Figure 4. The results of the investigation showed that the main conditions for aerobic humification were that the oxygen index was higher than 50%, the temperature was 100-70 degrees, the C / N ratio was 1: 3, the water content was greater than 75%, and proper addition of conditioning agents was appropriate.

Table 3: Literature summary analysis of the mechanism of aerobic digestion of municipal sludge humification

Parameter		Degradation rate(%)	Resource conversion rate(%)
Oxygen content	>50%	85.6	75.2
	<50%	55.7	55.3
Temperature	100-70	88.6	86.3
	70-40	44.5	57.3
	40-	34.6	34.8
C / N ratio	1/3	74.3	71.8
	1/5	23.6	45.7
Water content	>75%	76.8	67.4
	75-45%	57.9	56.3
	<45%	32.1	24.3
Conditioner	Have	82	78
	No	34	32

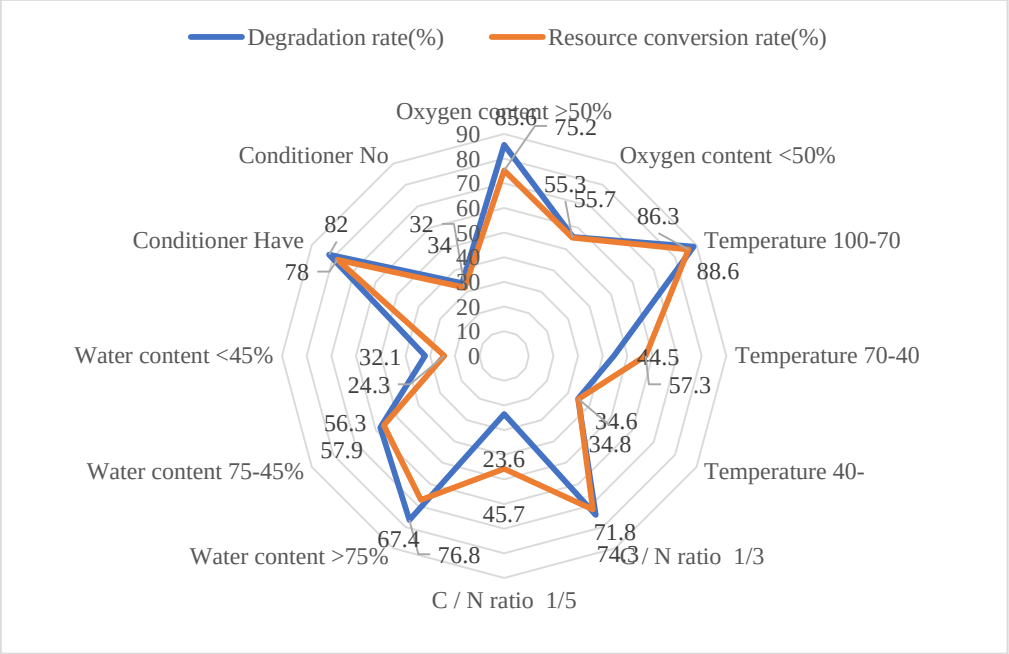

Figure 4: Literature summary analysis of the mechanism of aerobic digestion of municipal sludge humification

4.4. Investigation of Resource Conversion of Aerobic Humic Sludge Treatment Methods in Municipal Sludge Treatment Plants.

Investigate the three main municipal sludge treatment plants in a province, namely A, B and C. The resource conversion of the municipal sludge humification method based on aerobic digestion is shown in Table 4 and Figure 5. The results show that when the use rate of aerobic humus is about 30%, the resource conversion rate is about 60%, and the harmful substances account for less than about 3%. It is fully proved that aerobic humus is beneficial to improve resource utilization and reduce Discharge of harmful substances.

Table 4: Investigation on resource conversion of aerobic humic sludge treatment method in municipal sludge treatment plant

Municipal Sludge Treatment Plant	Aerobic humic use frequency (%)	Resource conversion rate (%)	Harmful substance (%)
A	35.6	64.1	3.4
B	24.5	58.9	3.5
C	34.3	62.3	3.2

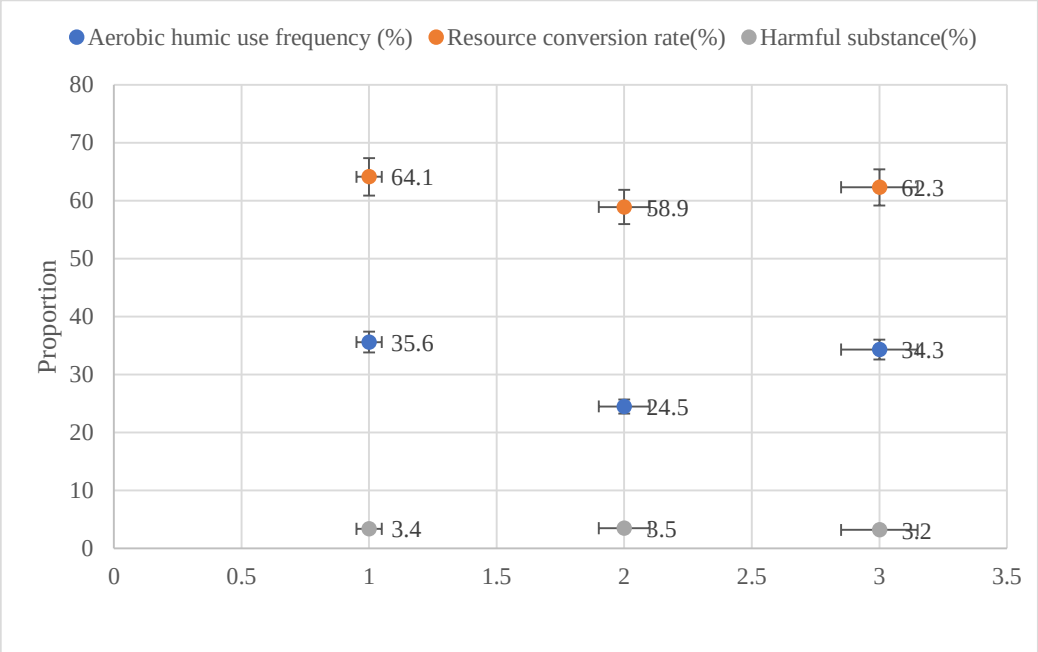

Figure 5: Investigation on resource conversion of aerobic humic sludge treatment method in municipal sludge treatment plant

5. Conclusions

(1) As the modern people's concern for the protection of human living environment and the improvement of social improvement and environmental protection awareness, this has also prompted more and more sludge to be treated, and a large amount of organic matter, heavy metals, pathogenic microorganisms, etc. Toxic and harmful substances. Direct exposure of untreated sludge will cause serious pollution to the water environment, atmosphere and soil, endanger the health of the surrounding residents, and may even cause serious environmental pollution incidents. In China, the supporting facilities for sludge treatment are not perfect, and the severity of sludge treatment is neglected. The sludge is rich in N, P, K and other nutrients required for plant growth. Through composting, it can effectively kill pathogenic microorganisms, achieve the stabilization of heavy metals, and degrade the concentration of polluting organic matter, which can be applied to garden greening Effectively supplement the organic matter of the soil. This article summarizes and analyzes the mechanism and resource utilization of municipal sludge humification based on aerobic digestion through a variety of survey methods and literature. The results showed that the use of aerobic humic methods increased year by year. At the same time, the ratio of untreated sludge also showed a significant downward trend each year. In line with this performance, its resource conversion rate has increased year by year. The current difficulties in using the aerobic humic method are mainly the difficulty in determining the maturity of fermentation, and the uneven

classification of non-degradable and dirt; aerobic humus is conducive to improving resource utilization and reducing the emission of harmful substances.

(2) This paper investigates the sludge treatment methods of a city for 5 years and compares its resource utilization rate through data; investigates the frequency of use of municipal sludge humification methods based on aerobic digestion in 3 major municipal sludge treatment plants in a province And the current difficulties; through literature and analysis of relevant industry personnel, summarize the mechanism of aerobic digestion of municipal sludge humification method; investigate the aerobic humification sludge treatment of 3 major municipal sludge treatment plants in a province The four aspects of the resource conversion of the method were investigated and concluded. The results show that the use of sanitary landfills and natural air-drying methods decreases year by year, while the use of aerobic humic methods increases year by year. At the same time, the ratio of untreated sludge also showed a significant downward trend each year. In line with this performance, its resource conversion rate has increased year by year. The current difficulties in using the aerobic humic method are mainly difficult to determine the degree of fermentation maturity, accounting for about 50%, and the non-degradable and non-uniform classification of dirt each account for about 25%. The literature summarizes that the main conditions for aerobic humification are that the oxygen index is higher than 50%, the temperature is between 100 and 70 degrees, the C / N ratio is 1: 3, and the water content is greater than 75%. Conditioners are added appropriately. When the use rate of aerobic humus is about 30%, the resource conversion rate is about 60%, and the harmful substances account for less than about 3%. It is fully proved that aerobic humus is beneficial to improve resource utilization and reduce harmful substances.

(3) In summary, the use ratio of aerobic humification is increasing year by year, and its use ratio is about 30%, and the resource conversion rate is about 60%, which can reduce the proportion of harmful substances to about 3%. The main occurrence condition is oxygenated The index is higher than 50%, the temperature is 100-70 degrees, the C / N ratio is 1: 3, the water content is greater than 75%, the previous difficulty is mainly the difficulty in determining the degree of fermentation maturity, and the classification of non-degradable and dirt is uneven . It fully proves that people are more and more aware of the importance of aerobic humus in the process of municipal sludge treatment. Among them, aerobic humus is conducive to improving the utilization rate of resources and reducing the emission of harmful substances, but the current use of aerobic humification methods. The proportion is not high, and there are mainly technical problems and dirt classification problems.

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