Based on the Network and Information Technology, the Actual Performance Evaluation System of Heavy Metal Removal Biomass Materials in Water Was Developed

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Abstract. With the rapid development of information technology such as big data, Internet of things, cloud computing and artificial intelligence, the combination of advanced technology has become an inevitable trend of biochemistry development at the present stage, and also brings new opportunities for the development of this field. In order to better combine information technology with biochemistry, this paper established an evaluation system for the actual performance of heavy metal biomass material in water removal, and systematically studied its adsorption mechanism. In this paper, 12 kinds of adsorbents of primary materials, carbon black materials and modified materials were prepared by crushing, charring and modifying four kinds of biomass, namely rice stalk, wheat harvest, corn and rice and peanut shell. The adsorption of Cu by these 12 adsorbents was studied. Combined with information technology, the use of scanning electron microscopy (SEM) analysis, specific surface area and adsorbent for the characterization of infrared spectrum analysis and study, adsorption time, pH, adsorbent additive quantity, temperature, ionic strength, competition from Cd adsorption effect on the adsorption effect, build the evaluation system, in the end, to evaluate the material removal efficiency of the experiment efficiency, are all over 92%, which is beneficial to the combination of information technology and biological chemistry development.

Keywords: Adsorption Dynamics, Evaluation System, Information Technology, Activated Carbon

1. Introduction

The development of social science and technology has promoted the continuous innovation of computer applications. As we all know, computers have great limitations in the initial application and the processing of information and data is not very comprehensive. Nowadays, computer through constant evolution and optimization, computer’s ability to handle data has an obvious promotion with independent integration and management of network information. In recent years, with the rapid development of the economy in China, a large number industrial wastewater containing heavy metal ions with refractory, high concentration and fat is produced every year by mining, metal smelting,
rubber, electrolytic plating, plastic, medicine, dyes, chemical fertilizers, leather, and other industries, which demages to soil, water, air, food chain and human health. Heavy metal pollution has become a serious environmental problem in the world. Therefore, the combination of information technology to solve the problem of heavy metals, has become a hot trend.

Previous studies have proposed different types and contingency factors affecting it governance. However, despite this valuable work, IT is still not clear through what mechanisms IT governance affects organizational performance. Ping-ju Shelly demonstrated in detail the mediation of strategic alignment in this process. Strategic alliances remain a top priority for business and IT executives, but theory-based empirical research on the relative importance of factors affecting strategic alliances is lagging behind. By integrating strategic alliances and IT governance models, ping-ju Shelly proposed a theoretical model that shows how organizational value is created through IT governance mechanisms. Ping-ju Shelly's research model draws on the resource-based perspective of the enterprise and provides guidance on how to adjust the effectiveness of IT governance on organizational performance through strategic alignment. Therefore, IT helps align the knowledge base of the IT governance literature [1].

Achieving the business benefits promised by the IT system is closely related to the continued integration of the system into the working practices IT intends to support. While much is known about the different social, cognitive, and technical factors that influence initial adoption and use, little is known about the role of emotional factors in user behavior. In an in-depth field study at two north American universities, mari-klara Stein examined the role of emotion in shaping specific patterns of IT use. Mari-klara Stein found that information technology stimulus events have five different characteristics, triggering a single category of emotions when they interact in an reinforcing way and complex emotions when they interact in an opposing way. When users respond to consistent emotions with clear adaptive strategies, they deal with conflicting emotions by combining different adaptive behaviors, a strategy that oscillates between emphasizing the positive and negative aspects of the stimulus [2].

The electronic health record (EHR) is a documentation tool that produces data which is useful in enhancing patient safety, assessing the quality of care, maximizing efficiency, and measuring staffing needs. While nurses praised the electronic medical records they also complained about their design and cumbersome electronic procedures. Lavin Mary Ann describes the views of members of the nursing practice committee of the Missouri nurses association, which encourages nurses to share their concerns about the EHR with IT staff and suppliers, and to take a role in making nursing related IT decisions. Lavin Mary Ann model describes the experience of reasoning and the reflection action, to understand the views of staff nurses, to share the commission's opinions and Suggestions, in order to improve the files and technology, and through the nurses are encouraged to develop their files and informatics skills, nursing, files, and practice issues including drug safety standards, as well as the efficiency of EHR [3].

With the development of computer technology, the application of information is more and more common in life and work. In this paper, an evaluation system for removing heavy metals from water was developed by combining network and information technology, so as to improve the efficiency of evaluation materials. Biochar adsorption, as an important and efficient pollutant removal method, has attracted much attention in the field of heavy metal pollution control. For better treatment of heavy metal pollution of the environment, this paper summarizes the existing research results at home and abroad, analyzed the adsorption mechanism and adsorptive properties of biochar, and the biological carbon in the water pollution of heavy metals and organic pollutants adsorption ability and application status are analyzed and summarized, combining evaluation system analysis the efficiency of all kinds of adsorption materials, put forward reference for solving heavy metal pollution.

2. Proposed Method

2.1. Information Technology

(1) Application

China is the same as other countries in the world in terms of information construction and
development. Now, whether the country or enterprises and institutions, are carried out in the internal information construction, this is the application of "dot"; With the continuous development of network, the business information system is gradually established comprehensively, which is the application of "line". In order to realize the sharing of information resources, the business work can be carried out in a better coordinated way. With the continuous improvement of application, all social organizations, regions and industries begin to improve the management of informatization, and the integration of the upstream and downstream value chain is realized, so that the support of the whole business scope can be established [14-8].

(2) Transformation
In the process of starting the construction of informatization, due to the insufficient understanding of informatization, the development mode of informatization is mainly technology-driven, and IT technology manufacturers are the main driving force for the development of informatization. With the continuous emergence of informatization, the awareness of organizational informatization is gradually accepted, and informatization begins to be transformed into business-driven mode. The cooperation between IT department and business is getting closer and closer. With the continuous change of the external environment, informatization is constantly being innovated, and some industries begin to transform to the strategy-driven mode in the informatization construction, and the deeper combination of business and IT is bound to realize the coordination of the whole society under the support of informatization [6].

(3) Risk prevention
1) Enhance users' network security awareness
The strengthening of network security not only needs the protection of technical means, the more important is to improve the comprehensive quality of network security maintenance personnel. The comprehensive quality mentioned here not only requires professional network security knowledge, but also needs to have a strong professional quality, and constantly improve personal network security awareness [7].
2) Take risk prevention and control measures for safety planning
In order to protect network security, it is necessary to strengthen and improve the security planning and management system. In the process of using the network, the network security management system can be built according to one's actual needs [8].

2.2. Heavy Metal
It has become an indisputable fact that the heavy metal pollution in China's water has become increasingly serious. According to the monitoring results of the sediment sections of 906 water supply sources in China, 732 sections were polluted by heavy metals, and the pollution rate reached 81%. There are 332 sections beyond the standard, the exceeded rate reached 37%. Among the monitored sections, the most contaminated by lead, dust and cadmium were 46%, 1% and 43%, respectively. Heavy metal wastewater, if not effectively treated, exceeds the standard or is secretly discharged into the water, will cause serious pollution to the water, heavy metals will continue to accumulate in aquatic organisms, and with the increase of biological chain level and increase, produce significant toxic effect on organisms.

Biomass carbon is a stable carbon-dominated material, which can be obtained by thermal or hydrothermal processes under the condition of oxygen sequestration. The pore structure can be improved and the specific surface area and the number of surface functional groups can be increased. The adsorption capacity of primary carbon to pollutants in water is limited, and the surface of modified carbon is rich in functional groups, which can improve the adsorption performance. At present, the commonly used modification methods include physical modification and chemical modification. The modified biomass carbon can be used as an adsorbent to effectively remove pollutants in aqueous solution [9,10].

3. Experiments
3.1. Experimental Background
Most heavy metals belong to transition elements, which have variable valence state and high chemical activity, and can participate in a variety of chemical reactions. Meanwhile, under Eh (REDOX potential), ligand and pH conditions in different environments, their valence state, combined state and binding state are often different. The toxicity of heavy metals varies with the change of valence state. For example, the toxicity of zero-valent copper is less than that of divalent copper. Chromium trivalent is less toxic than chromium hexavalent. The stability and toxicity of heavy metals also vary with the morphological changes. For example, when heavy metals change from an unnatural state to a natural state, the toxicity usually decreases. The toxicity of copper, zinc and lead complexation is far less than that of ion, but its stability is better.

The rapid development of information technology for the biochemistry of the intelligent management has brought unprecedented opportunities, in the face of heavy metal pollution, this paper established a combination of information technology is relatively simple evaluation system, to quickly process the data, finishing material, in order to compare the adsorption of heavy metal pollutants, provide data reference for heavy metal pollution and control.

3.2. Experimental Design
Raw materials from the surrounding towns. Clean it with tap water, keep the temperature in the oven at 15℃, dry it and take it out. Crush it into powder shape with a crusher. After sieving the sample with 108 mesh, store it in a jar and bottle it for later use. Bombarding the surface of the material, scanning the surface of the material by the interaction between the material and the electrons. An electrical signal will be generated in the excited area, which is formed by secondary electrons and can produce an enlarged image of the material's surface. The surface morphology of the sample can be observed by imaging the electrical signal. Therefore, the structure and pore size distribution of adsorbent can be clearly observed through the material surface layer and under different sections with different magnification ratio.

In this study, FLAC software was used to carry out the evaluation activities, with the purpose of obtaining the efficiency data of adsorption of heavy metal pollution of different materials for comparison. The results are shown in Table 1.

Table 1. The maximum adsorption amount of different heavy metals in water by different biochar

| Rawmaterial for biocharpreparation | Pyrolysis temperature/℃ | Heavy metal | The maximum absorption Capacity(mg/g) |
|-----------------------------------|--------------------------|------------|-------------------------------------|
| Walnut green husk                 | 500                      | Pb$^{2+}$  | 476.190                             |
| Walnut green husk                 | 500                      | Cu$^{2+}$  | 153.846                             |
| Hickory                           | 600                      | Pb$^{2+}$  | 153.100                             |
| Hickory                           | 600                      | Cu$^{2+}$  | 34.200                              |
| Rice husk                         | 450                      | Cd$^{2+}$  | 28.100                              |
| Maize stalk                        | 450                      | Pb$^{2+}$, Cd$^{2+}$ | 102.660 |

4. Discussion

4.1. Analysis Based on the Actual Performance Evaluation System of Heavy Metal Removal Biomass Materials in Water
As shown in Figure 1, under the condition of 25℃, the adsorption amount of Cu with the concentration of 100ml and the concentration of 100mg/L for the four adsorbents of 0.20 g of raw materials changes with time. The adsorption of Cu on rice straw, wheat and rice, corn and rice and peanut shell mainly went through three stages. In 1 hour, Cu showed rapid adsorption on four kinds of raw material adsorbants. The adsorption capacity of Cu on rice stalk, wheat slightly, corn and rice and...
peanut shell reached 3.5mg/g, 3.0mg/g, 6.6mg/g and 12.2mg/g, respectively, reaching 43.8%, 51.8%, 65% and 41.1% of the equilibrium adsorption capacity. After 1h, the second stage was to reach the adsorption equilibrium. Cu showed a slow adsorption rate and a slow increase in adsorption capacity on the four raw materials adsorbents. In the third stage, the adsorption equilibrium stage, the adsorption capacities of rice straw, wheat and rice, corn and rice and peanut shell to copper ions were basically unchanged after 10h, 12h, 8h and 12h respectively, and the adsorption equilibrium was reached.

![Comparison results of adsorption materials](image)

**Figure 1.** Comparison results of adsorption materials

4.2. **Suggestions Based on the Actual Performance Evaluation System for Removing Heavy Metals from Water Biomass Materials**

The whole process of information tracing can ensure the credibility and integrity of the data. Through the integration of the data platform, the nursing dynamic management chain can be formed, which can query the detailed items of the data collected by each system, to avoid information acquisition errors and distortion in the transmission process, so as to form wrong results and affect the decision. At the same time to ensure the integrity of the data in cryptography digital signature and message authentication technology can be used to verify the integrity of the data.

It is suggested to develop mobile terminals based on artificial intelligence, connect the big data platform with the data terminal, and realize the dynamic storage of data. This is not only convenient for users to access, but also beneficial for managers to realize the dynamic monitoring of data through the real-time update of the database. Semi-structured data and unstructured data in the records can be analyzed through visualization technology, fuzzy logic, neural network, machine learning and other technologies to discover the hidden correlation or sequence of data, show the change trend of data in a visual form, predict the relationship between data, and give the prediction results.

5. **Conclusion**

As the continuous evolution and optimization of the computer, its ability to process data has been significantly improved, which is able to rely on the network for independent information integration and management, information data platform established, and the speed of operation is accelerated. In this paper, with the aid of the network and Internet technology, the removal of heavy metals in water biomass material actual effectiveness evaluation system is built. Through the evaluation system, the collected adsorption of heavy metals in all kinds of biomass material contrast data are analysisd to select suitable materials for the adsorption of heavy metals, which makes the whole experimental
process more efficiency and is beneficial to the combination of information technology and the biochemistry.

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