Research on Prevention of Indoor Air Environment Pollution by Building Decoration Materials

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Abstract. With the renovation of indoor buildings in recent years, the problem of air pollution has become more and more serious. With the continuous improvement of people's living environment requirements and the constant pursuit of quality of life, interior architectural decoration has become a common phenomenon, and the decoration technology has become more and more sophisticated. At the same time, the unqualified building decoration materials also caused serious pollution to the indoor air environment and caused serious damage to the health of the residents. This study analyzes the status quo of indoor environmental pollution from the decoration materials, and gives corresponding control, treatment and preventive measures for various building decoration materials that cause indoor air pollution.

Key words: Indoor environmental pollution; building materials; indoor air; prevention.

1. Introduction
At present, with the renovation of indoor buildings in recent years, the problem of air quality pollution has become more and more serious. The indoor pollution of indoor building decoration materials has become a new type of pollution phenomenon in the society. Chemical pollution of building decoration mainly refers to people in the process of decoration design and renovation, because there are substances in the selected materials that are harmful to people and the environment and may cause harm. Generally speaking, the above pollution contains three parts: physical, chemical and biological. Physically, it mainly refers to radioactive substances such as gamma rays, and chemistry is mainly formaldehyde which is common in organic and inorganic substances. There are many analytical methods for chemical contamination components. From the biological aspect, it is mainly the pollution of mites and other bacteria, such as indoor mites and mites in toys. At present, urban residents occupy about 80% of the time in the house every day, so the indoor environmental quality problems continue to attract people's attention. From the current hazard results, people's sensitivity to chemical pollution is still insufficient, and formaldehyde, benzene and ammonia are seriously exceeded. Substances, such as organic matter, will release organic and inorganic pollution, resulting in a continuous deterioration of air quality, causing serious harm to people's health. The seriousness of the problem is no less than the outdoor situation [1].

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2. Main pollutants in indoor environment
During the building renovation process, many pollutants are produced, which have a great impact on human health. The first thing to mention is formaldehyde. Formaldehyde is an irritating pollutant. Many building materials contain formaldehyde. Formaldehyde is a highly toxic substance that can cause cancer or body distortion in the long-term environment of formaldehyde [2]. The second most serious pollutant is benzene. Benzene is a volatile and liquid, which is commonly found in construction materials such as paints and coatings. It has great damage to the human respiratory system and skin, especially for children, which is one of the predisposing factors for severe leukemia. The third category is radioactive contaminants that cause persistent, irreversible damage to human health. Radiation pollutants are very much in materials such as marble or granite, and are commonly found in floors, tiles, and the like. The long-term presence of radioactive elements can cause serious diseases such as cancer [3].

3. Harm of pollutants in building materials

3.1. Formaldehyde
Formaldehyde can stimulate the skin and mucous membranes of the human body, causing the protein lipids in the cells to coagulate and become denatured, and will destroy the normal function of the cells; when the body inhales formaldehyde, it will generate methanol inside, which will destroy the human retina and affect people's vision. Formaldehyde can also affect people's sense of smell and stimulate people's breathing; long-term inhalation of formaldehyde can affect the body's multi-faceted immune function, making the body's resistance weaker; some people have problems with memory loss, lethargy, etc., if the home is detected if the formaldehyde exceeds the standard, it is likely to be caused by formaldehyde pollution.

3.2. Volatile organic compounds
Volatile Organic Compounds: 1 causes themselves to the human eye, making people look blurred; 2 irritating the human respiratory tract, causing allergic rhinitis, asthma and other respiratory diseases; 3 affecting human skin, making people allergic to skin, causing allergies, redness, itching and other symptoms; 4 more serious symptoms of headache, sore throat and weakness; 5 volatile organic compounds of benzene, vinyl chloride, polycyclic aromatic hydrocarbons, etc. are identified as causing cancer Culprit. The identified hazards of volatile organic compounds mainly affect the unpleasant smell and irritations; it is still unclear but suspected to have adverse effects: local tissue inflammation and neurotoxicity

4. Analysis of the hazards, pollution performance and misunderstanding of the decoration materials on the indoor environment

4.1. The harm of decoration materials to indoor environmental pollutants
The important pollution source of decoration materials for indoor environmental pollution, reasonable control of the decoration materials to the indoor environment pollution has a pivotal position to achieve the sustainable development of the decoration industry, and should occupy an extremely important position in the indoor environmental legal system. The lack of control materials for the indoor environment in China is not conducive to the full play of the effect of decoration materials on indoor environmental pollution control. Compared with other countries, it is obviously lagging behind. The policy of public participation in indoor environmental protection and purification was further clarified. Local residents are often the direct victims of indoor environmental problems and the requirement to implement democratic principles. The control of the scope, project and content of the indoor environment is closely related to local social and cultural factors.
4.2. Performance of decoration materials on indoor environmental pollution

Air pollution is the main pollution of the indoor environment by the decoration materials at present, and the green indoor living environment and space environment can effectively protect the indoors and reduce the indoor air quality. In the decoration process, due to the serious pollution of the indoor environment in China, the indoor environmental pollution has become a major factor affecting the building environment. The quality problem of decoration materials is an important means to alleviate the environment. In the process of publicizing indoor environmental protection knowledge, the effective purification of indoor materials should be effectively prevented. It is necessary to consider the role of planting green plants. The decoration materials are easy to cause immunity to children. The force is reduced, and there are symptoms such as colds and coughs.

4.3. Misunderstanding analysis of interior materials in decoration materials

The prevention of indoor environmental pollution is only a declaration of public participation in the control of indoor environment by the decoration materials, and it is impossible to achieve effective control of indoor environmental pollution by the decoration materials. At present, China lacks the evaluation criteria for the quality of decoration materials, and cannot effectively detect the relevant decoration materials. Plus the lack of professional testing qualifications in the market. Therefore, the decoration materials are prevented from invisible pollution to the indoor environment. Therefore, in order to purify the indoor environment, the environmental awareness of the occupants should be strengthened, the indoor environment should be continuously optimized, the indoor air should be purified through green plants, and the residents' awareness of the decoration materials should be improved. Ability becomes critical.

5. Method for preventing and controlling indoor air pollution caused by building decoration materials

In 2004, China promulgated the “Technical Essentials of Healthy Housing Construction”. Among them, the control indicators for the indoor air environment pollutants are clearly put forward. The indoor air pollutant control indicators are shown in Table 1.

| Contaminant name          | standard value | Remarks         |
|---------------------------|----------------|-----------------|
| NH₃ (mg/m³)               | 0.20           | 1 h average     |
| CO                        | 10             | 1 year average  |
| C₆H₆ (mg/m³)              | 0.10           | 1 h average     |
| Rn (mg/m³)                | 100            | 1 h average     |
| CO₂ (%)                   | 0.10           |                 |
| CH₂O (mg/m³)              | 0.11           | 1 h average     |
| Total volatile organic compounds (mg/m³) | 0.60 | 8 h average |
| Total number of bacteria (unit/m³) | 2500 |             |

If we want to have a healthy and comfortable residential environment, we must control and prevent the pollution of the indoor air environment. When indoor decoration is carried out, we must carry out the procurement of indoor building decoration materials in accordance with the standards set forth in the “Code for Indoor Environmental Pollution Control of Civil Building Engineering”. When we purchase building decoration materials, we must require the merchants to show the effective detection of relevant indicators. It is reported that once the harmful substances in the building decoration materials are found to exceed the standard, procurement must be prohibited. If the inspection items are found to be incomplete or the results of the inspection are suspected during the interior decoration, it is necessary to send the qualified building decoration materials to the testing organization for testing, and then continue to use them in the interior decoration.
6. Control of Indoor Air Pollution by Building Decoration Materials

(1) The source of indoor air environmental pollutants mainly comes from building decoration materials. Therefore, when performing indoor building decoration, the selected building decoration materials must be strictly checked. According to the “National Compulsory National Standard for Limits of Hazardous Substances in Interior Decoration Materials” jointly issued by the National Standardization Administration Committee and the General Administration of Quality Supervision, Inspection and Quarantine in 2001, it is strictly forbidden to use the building decoration materials that do not meet this standard in the interior decoration project. Sales [4]. Control the pollution of the indoor air environment from the management of building decoration materials. Although benzene, formaldehyde and other organic volatiles are harmful to the human body, these substances are indispensable components in adhesives and coatings. The national standard only specifies the minimum content of hazardous substances, and the building decoration materials that meet the standards still contain harmful pollutants. Therefore, when we carry out interior design, we must consider the use of building decoration materials that meet the national pollutant control indicators, but also consider the scale of use of building decoration materials, and also choose the decoration process without pollution, and during the renovation and decoration. For a long time after completion, it is necessary to open windows and provide more ventilation to enhance indoor air exchange. In the interior decoration, even if it adopts the building decoration materials that meet the national standards, it is best not to use it in a large area. It is necessary to determine the accommodation capacity of the indoor space. Otherwise, excessive accumulation of harmful gases will also cause indoor air pollution. At the same time, we must resolutely put an end to the use of building decoration materials that are prohibited by the state [5].

(2) When choosing furniture, choose furniture without pungent odor, and also pay attention to whether the furniture is edged. Avoid contamination of the indoor air environment due to improper selection of furniture.

(3) After the renovation, you should not check in immediately. You should first carry out indoor ventilation for a period of time, so that the harmful gas of building decoration materials will be volatilized for a period of time to reduce the pollution level of indoor air. If you can equip with air purifier, the effect will be better.

(4) Relevant properties should be cleaned and repaired in time for air exhaust equipment and central air conditioning, and damaged equipment should be repaired and replaced in time. In short, the pollution of indoor air environment is a pollution problem that occurs when humans use building decoration materials. It can be completely solved by human existing technology. As long as the prevention work is done, indoor air pollution can be effectively controlled.

7. Effective prevention of indoor air pollution

7.1. Effective ways to deal with indoor environmental pollution

7.1.1. Simplify interior decoration. Since the pollution is mainly caused by building materials, in the decoration process, the design of the interior decoration should be simplified as much as possible, and the building materials should be used less. Do not blindly pursue luxury and complex decoration styles. Environmental protection and health should be the primary requirement, and the possibility of pollution should be eliminated from the source. At present, many young people are chasing indoor, beautiful, luxurious, and large-volume home improvement materials. These home improvement materials are more or less polluting. Therefore, the best way is to simplify the interior decoration.

7.1.2. Reasonable choice of building materials. The key source of indoor environmental pollution is building materials, so the first way to solve indoor environmental pollution is to rationally choose building materials. For the choice of building materials, health is the most important measure, choose some non-polluting or less polluting materials, and give priority to the use of green environmentally friendly materials to provide the necessary conditions for indoor environmental health. At present, many
plates have polluting gases such as formaldehyde, including door paints. Therefore, in the process of selecting plates, high quality plates and paints should be selected.

7.1.3. Enhanced ventilation. One of the main pollutants contaminated by indoor environment is volatile substances. Therefore, after the renovation is completed, sufficient time should be left for the volatilization and loss of toxic pollutants. Through ventilation and long-term ventilation, the indoor pollutant content is reduced to a reasonable range acceptable to humans, ensuring the maximum discharge of volatile substances such as formaldehyde. Moreover, harmful gases are a long-term discharge process, so long-term ventilation is required.

7.2. Prevention measures for indoor air pollution
(1) Formulate relevant management regulations to incorporate indoor air pollution prevention and control into legal supervision.
(2) Develop more effective testing methods and corresponding health standards.
(3) Control indoor air pollution sources. It is banned from the production of building decoration materials that seriously infringe on human health, and penalties are imposed on manufacturers who use hazardous materials privately [6]; manufacturers are encouraged to produce non-toxic or low-toxic building decoration materials.
(4) Strengthen supervision over the selection of building decoration materials.
(5) Conduct sanitary supervision on ventilation and ventilation equipment and central air-conditioning systems for indoor building decoration.

8. Conclusion
In summary, the control system for indoor environmental pollution by decoration materials is an important system for comprehensive prevention of environmental pollution and ecological damage, and is essential for protecting human health. In order to effectively prevent indoor air pollution problems, relevant personnel must properly handle decorative and decoration materials, plant green plants, achieve comprehensive adsorption of harmful substances, adhere to long-term ventilation, and choose formal high-quality and low-pollution decoration products. At the same time, the enterprises that produce decorative materials must be committed to the production of industrialized, green and environmentally friendly decoration materials, and continuously reduce the harm of decoration materials to human health.

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