Develop Green Building Materials, Optimize the Living Environment

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Abstract. This article illustrates the necessity and importance of widely use Green building materials by describing the meaning of the living environment and green building materials, and the problems existing in the current environment. On this basis, it put forward how to better application in the living environment of green building materials, to ensure the proper solution of the current living environment problems.

Introduction

Living environment is the survival of mankind, is engaged in the production and all kinds of social activities in the environment. We usually understand the living environment of the bedroom, housing and living areas. Actually from individual activities in house, to all kinds of buildings and settlements, and available for human development and utilization of the whole space of the earth's surface, It can be regarded as living environment. Therefore, development of green environmental protection building materials, beautify the human living environment, is especially important to us.

The Meaning of Green Building Materials and the Status of the Living Environment

Green building materials means environmental building materials, it has the properties such as ecological, environmental protection and health of construction materials. First of all, it is renewable resources from the ecological environment, should be based on the perspective of sustainable development. And in the raw materials acquisition, production, processing, use and abandoned the process achieve zero pollution; Secondly, green building materials’ ‘green’, should also be reflected in its digestion and utilization of industrial waste, environment purification function.

Recently, the national leadership make important instructions about improving rural living environment by adjust measures to local conditions. Since the development of ‘live’ concept about living environment in the 1960s, it has a history for more than half a century. Initially formed human living environment science system, and it is widely recognized around the world. According to verification, from 1972 the United Nations took a conference about ‘human environment’ in Stockholm, to China wrote ‘the human settlements sustainable development’ as an important content in <China's agenda 21> in March 1994. And then to the second earth summit in 2002, the world conference on sustainable development, the living environment issue has caused the attention of the world, the improvement of the living environment has become a global common platform, for the purpose of sustainable development of human living environment problem has become the most of the times.

The Main Problems Existing in the Living Environment

As we know, the development of science has made humans control and dominate nature in a certain range, a certain extent. However, humans can effectively and scientifically use natural, but absolutely can't indefinitely destroy the ecological balance. Otherwise, people get carried away will bring harm to natural and destruction. The waste of resources and intensify of pollution will make devastating damage in living environment.
1) Along with population explosion, we face a serious shortage of ecological resources. In 1999, the world's population reached 6 billion. With snowballing growing population, there is no doubt that brings to heavy pressure to earth. Some experts estimate that by 2040, there will be a global food shortage. Until around 2070, there will be a depletion of fossil fuel resources such as metal, coal, oil resources. All of these, will harm the quality of living environment and human survival.

2) The pollution of urban environment is serious. The first is air pollution. SO2 and smoke emissions will cause the ‘greenhouse effect’. Produced by SO2 acid rain will cause the water quality decline, soil acidification, destroying vegetation and buildings; The second is the pollution of indoor environment. Nowadays, indoor decoration is popular, thus produce decorative materials for indoor air pollution, the harmful material such as formaldehyde, heavy metal particles, radon pollution than outdoor air several times, and most of time is spent indoors. As a result, the indoor environment is the key to improve the living environment.

3) The influence of building materials for the living environment. In the history of mankind, building materials has played a positive role, created the human history and culture. However, with the increase of population, the increasing scale of construction, the traditional building materials has also exposed some problems which seriously endanger the living environment of human beings. Not only consume large amounts of resources and energy, but also cause serious damage to the environment. Such as cutting into a mountain to mine iron, destruction of natural landscape; Cement have been do more harm to environment, the high density of concrete, make the city space permeability is bad. When it rains, water accumulate in the ground can’t be discharged, and groundwater can’t be added. The temperature of city center is generally higher than suburbs, someone call it ‘concrete forest’.

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In conclusion, it can be seen that the improvement of the living environment and building material of clean production and green building materials are closely related. Modern green civilization requires that we should advocate natural, adapt to nature, nature and humanity. As we can say, living environment for green building materials, and green building materials to create and improve the living environment. Therefore, for developing green building materials, beautify the living environment, building a harmonious home, we should set out to do the following several aspects at present:

1) Increasing research and development efforts, focus on the development of green building materials. Such as the aspect of research and production about building materials, we should develop the environmental and high performance concrete, dry powder mortar etc. To improve the resource utilization rate and secondary energy utilization rate, recycling industrial waste and other waste, strengthen the skills of environmental protection and measures to implement comprehensive system of environmental protection. Firstly, we should construct an environmental cement factory which is environmental protection, reforms the traditional cement enterprise, uses the clean production process, and makes the most effective use of natural resources and energy. These factories really implement a guarantee system of environmental protection, the discharge of dust, waste residue, waste gas emission is almost close to zero, which truly achieve the goal of zero pollution; Secondly, The development of high performance concrete, besides it has excellent mechanical properties, it also has high durability, volume stability and economic rationality, thereby it can reduce the consumption of energy used in construction and reduce noise pollution. Now, it has many important buildings according to 100 years use-by design, moderate climate conditions of land construction has use-by design in 200 years. In addition, concrete can be mixed with some admixtures: ground granulated slag, fly ash, silicon fume and rice husk ash, which saves the cement and help absorb the industrial waste residue. Therefore, high performance concrete is also called ‘green concrete’ or ‘ecological concrete’; Development of dry powder mortar again by dry sieving process of fine aggregate with inorganic thickening material, mineral admixture and additive are mixed according to a certain proportion, make a kind of ‘green building materials’. Strive to overcome the shortages of traditional
mortar of poor quality, low efficiency, raw materials occupied the construction site, and stay its high
strength, multi-function, good durability advantages. Its excellent quality and the reduce of
maintenance costs and the costs of environmental pollution control, its profit is far greater than the
cost. It is a kind of intensive construction materials. So, intensively study the performance of dry
powder mortar products, to design a clean manufacturing process, and to strengthen the promotion of
these products, it is meaningful for improving the living environment.

2) Development of high quality cement clinker, adjust the structure of cement products, making it
become an environmental cement. At the same time, reduce the dosage of cement on the premise of
meet the engineering requirements. Promoting commodity concrete in order to reduce the stir caused
by noise pollution and dust pollution, and is helpful to control the quality of the concrete.

3) City on the ground, should develop water permeability and drainage ecological concrete and
capable of growing vegetation concrete, in order to solve problems like urban rainwater drainage
difficulty, air drying, high temperature etc. In urban road on both sides, in areas such as the slope
protection on the water edge, it makes people have more opportunity to close to nature through the
application of vegetation green concrete. At the same time, also beautify the urban environment.

4) Study on beneficial to human health and environmental protection coatings which is friendly
and no pollution to the environment. Such as antimicrobial self-cleaning coatings and coatings of air
purification. Then there is the functional coatings, has the health function and the function of the
anion release: The designers have to make design of material from the view of development.
Construction should be fully considered in the design of use fixed of year, extension or modification
in the future, strive to make their own building in the next few years and even decades won't lag
behind, in order to minimize redundant construction.

5) The country shall establish and improve the system of laws and regulations. Strengthen
legislation and supervision, establish and perfect the laws and regulations, increase quality
supervision and standardize the building materials market. Take coercive measures to help the
promotion of green building materials when it is necessary.

Summary
Ecological civilization will make human life in a safer and better environment. As the citizen of new era,
advocate environmental building materials, beautify the living environment, it is our obligatory
responsibility. We should reconsider our behavior, pay more attention in our inhabit environment. There
are green building materials decorating our living room, and a green civilization is dressing up our mind.

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References
Building Press, 2008;
[5] Xu Yongmo. Some questions about the correct understanding of green building materials. China
Building Materials, 2003(9).