

# ECOMATERIALS DEVELOPMENT AND APPLICATION

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**Abstract:** This paper summarized the general situation, development present situation both at home and abroad, and its application etc on ecomaterials, there are a overall understand on new progress in research on ecomaterials.

**Keywords:** ecomaterials; EIA ( Environment Impact Assessment)

Material industry is holding human society's development, has brought the convenience and the advantage for the humanity, but simultaneously in the material production, processing, the circulation, the consumption, the use, recycled in the process which and abandoned also to bring the heavy environment burden. This urges the various countries' material researcher to carefully examine the material from the beginning the environment burden, research material and environment mutual function, quantitative evaluation material life cycle to environment influence, research development environment coordinative new material. This has produced an emerging discipline—ecomaterials.

## **1. Ecomaterials survey**

The ecomaterials is one kind to improve the ecological condition, the government environmental pollution, the purification and the repair environment material. [1]

### 1.1 Ecomaterials classification

The ecomaterials includes: environment engineerig material, green packing material, environment building material, environment degeneration material, environment purification material, environment repair material, environment substitution material and so on.

### 1.2 Ecomaterials characteristic

The ecomaterials should have three characteristics: One is the material sophistication; Two is the ecological environment coordination; Three is material comfortableness.

### 2. Domestic and foreign ecomaterials present situation

The ecological ecomaterials is in the humanity realized walks to the ecological environment protection important strategic sense and the various countries under the sustainable development path background to raise in abundance, is domestic and foreign the material science and engineering research development inevitable trend.

#### 2.1 Overseas ecomaterials present situation

1991 year Japan first puts forward the ecomaterials concept.Held four ecomaterials international conference since 1992.The European state, Japan, Canada, country cooperations and so on US and China has published “the ecomaterials handbook”.[2,3]

In 20 year after today, should request explicitly the material science and engineering worker realize:

(1)While satisfies the user as far as possible to material performance requirement, must consider saves the resources and the energy as far as possible, reduces as far as possible to the environment pollution, must change the one-sided pursue performance the viewpoint;

(2) When the research, the design, the preparation material as well as the use, abandon the material product, certainly must material and in the product entire life cycle, to the environment coordination took the important appraisal target, the change designs the production by all means, after but does not attend to uses and abandons the resources regeneration use and the environmental pollution viewpoint;

(3) This definition development will involve multily-disciplinary overlapping, not only will be technical overlapping, moreover will have the wider knowledge foundation and a stronger practicality, not only will discuss the science and technology benefit, the economic efficiency, but also will have to discuss the social efficiency, the materials science technology industry concrete development targets and global, the various countries' sustainable development big goal will unify.

The ecological environment material is precisely raises under such background, is on 1990s international one of material science and engineering development newest tendencies.

This kind of material consumes to the resources and the energy few, to the ecology and the environmental pollution small, regeneration use rate high or degrades and may circulate the use, until moreover requests from the material manufacture, the use, to abandon in the regeneration use entire life cycle, all must have with the environment coordinated coexistence.[4] Material environment load assessment method (LCA) and standard (ISO14000) establishment. The International Standardization Organization has formulated the environment management international standard (the ISO14000 series) the related LCA basic principle (ISO14040) and the catalog analysis standard (ISO14010).The world environment database has surpassed 1000. Germany is in the world carries out the environment symbol most early the country.[5] Recently US promoted one kind newly the anti-chemical protective suit which made by 100% high density polyethylene, used in to contacts the virulent harmful

chemical the impediment protection. This product may recycle completely remakes, also may burn down processing, does not produce the halogen compound. Has carried on in Japan the glass fiber reinforced plastic material circulates again smashing processing, uses in the road oil material the strengthening and the modification.[6]

## 2.2 Our country ecomaterials present situation

Our country is a developing nation, along with reform and open policy and modernization development, environment question also more and more urgent pendulum in front of us. Our country's ecomaterials research may trace on the century 80's intermediate stages, in the agriculture the massive mulching plastic, big awning to plastic use, formation "white pollution". From this may degrade the plastic to the environmental protection the research development, is our country studies the ecomaterials the start.

Ecomaterials statement to our country steel and iron material development influence.(1) automobile uses the steel high strength; (2) special-purpose steel alloy new series; (3) based on regenerative cycle steel products ecomaterials study design concept.[7]

On the other day, an item for the first time settled down Nanjing University in the domestic development new ecomaterials and the renewable energy research, and has had the important gradualness research results in under the school support and the investment.

## 3. Ecomaterials development and application

The natural material development. Looking from the ecology viewpoint that, the natural material processing energy consumption is low, circulates renewably the use, easy to process, carries on the high added value development to the natural material, the obtained material has the advanced environment coordination performance and has the fine operational performance.

Recycle material design and development. Recycle metal material, if carbon steel anticorrosion coating material when recycling does not have to consider the coating the separation, causes the steel and iron to recycle the alloy environment burden to be smaller. The ecomaterials research already penetrated into industry each domain. In the resources and the energy effective use, reduces in the environment load the ecomaterials to have the very big superiority, realizes a material industry sustainable development important development direction.

The ecological ecomaterials is 1990s a new domain which forms in the international high-tech new material research, its research development in Japan, America, Germany and so on the developed country is extremely active. The main research direction is: (1) faces directly with the environment question correlation material technology, for example, the biology may degrade the material technology, the CO<sub>2</sub> gas solidification technology, SO<sub>x</sub>, the NO<sub>x</sub> catalysis transformation technology, the waste again converting into resources technology, the environmental pollution repair technology, in the material preparation

processing pure technology as well as saves the resources, the economical energy technology; (2) development can cause the economical sustainable development the environment coordinative material, like biomimetic material, environmental protection material, fleon, asbestos and so on deleterious substance substitution material, green new material and so on; (3) material environment coordination appraisal.

Our country also has carried on the massive work in recent years to the ecological ecomaterials research, also has obtained certain result.If from bakes the anode to the aluminum industry in and bakes the anode in advance the LCA appraisal, for from baked the anode craft the improvement provide the scientific basis.[8]

#### 4. Conclusion

The ecomaterials is one of material science and engineering most recent development tendencies.How the ecomaterials study main research reduces in the material processing and the use process to the environment destruction; Establishment quota appraisal material environment burden ecological cycle appraisal method (LCA); The environment load takes as inspection material the new target, uses in instructing the development to have the environmental awareness green material and the product; discipline knowledge and so on resources efficiency, ecological equilibrium, environmental protection, sustainable development integrate the materials science, protects the nature, benefits the humanity.As the 21st century advanced materials, the ecomaterials the collection material sustainable development, the resources regeneration use, front science and the technology and so on clean production in a body, makes to the national economy development the important contribution.

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