Study on the Recycling Technology of Street Tree Waste Recycling and New Lead Carbon Alloy Processing Technology

Wen-Na Hu\textsuperscript{1,a}, Shinn-Dar Wu\textsuperscript{2,3,4,b*}, Zhaoying Cai\textsuperscript{5,c}, Yea-Chyi Lin\textsuperscript{6,d} and Xiong-Dong Sun\textsuperscript{7,e}

1 Financial Management Major, Department of Business Management, Guangdong Neusoft Institute, China
2 School of Chemistry and Materials Engineering, Huizhou University, Guangdong, China
3 USA Saint Paul’s College & DePaul University, USA
4 Royal Global Business Center GEI-CTO, Philippines
5 Neusoft Institute Guangdong, China
6 Department of Aeronautics and Astronautics, National Cheng Kung University, Tainan City, Taiwan, ROC
7 Department of Business Management Business Administration Major, Guangdong Neusoft Institute, China

Email: \textsuperscript{a}767920565@qq.com; \textsuperscript{b}*13478511396@139.com; \textsuperscript{c}caizhaoying@nuit.edu.cn; \textsuperscript{d}2114699177@qq.com; \textsuperscript{e}2249545516@qq.com

Abstract. In view of the influence of road tree waste on human beings at present, and the treatment mode is single and the cost is high, with the help of ecological treatment technology and recycling garden greening waste, the pollution of greening waste can be solved, and this series of organic matter can be effectively applied to the technical development of battery material and hydrogen energy battery by introducing conductive carbon into the application point. Among them, it is mainly prepared by a special sintering technology and gas countercurrent technology, which can achieve the original appearance of retaining the leaves of the road tree, and the advantages of retaining the bulk fiber structure of the leaves after sintering, and the recovery rate is greatly higher than that of the traditional carbon materials. This technology will carburize the road tree waste, and will guide the road tree garbage carbonation technology. Entry carbon burning technology: bio-carbon market carbon black application (such as: domestic carbon rubber, tire, soil improvement), while greatly reducing carbon emissions caused by air pollution; introduction of fine carbon burning technology (NPG-SD): industry forward-looking chemical cell, fuel cell and electro thermal material technology green process design, while greatly reducing the raw materials and emissions of petrochemical industry caused by air pollution; And applied to agriculture and green energy, combined with power system integration, to achieve the purpose of complementary economy, technology and environment.

Keywords. Energy saving, carbon reduction, recovery and reuse, lead carbon alloy, street tree waste.

1. Introduction

General Secretary Xi Jinping pointed out in the report of the 19th CPC National Congress that China’s economy has changed from a stage of high-speed growth to a stage of high-quality development, and is
in a critical period of changing the mode of development, optimizing the economic structure, and transforming the driving force of growth. Building a modern economic system is an urgent requirement across the border and a strategic goal for China's development. In order to complete the leap from industrial 3.0 to industrial 4.0, steadily move towards the goal of industrial 4.0 and 2025 intelligent factories, and become the current South China Sea. Some of the biggest problems faced by traditional manufacturing enterprises.

For a long time, Guangdong street trees often encounter human and natural disaster damage, and soon die and leave residual leaves and dead branches, and even many big trees are uprooted in storms, which not only affect the beauty of the environment and cause waste of resources; in addition, the waste of street trees is often burned and treated, which has a serious impact on the environment. Taking Foshan as an example, the treatment of garden greening waste is mainly simple landfill. According to the relevant data, more than 90% of the green waste in China is solved by landfill. As a result, a series of problems have arisen. Simple landfills not only occupy a large amount of land, but also increase transportation costs and disposal loads. At the same time, it will also lead to leachate pollution and CH$_4$ release and other environmental problems. In places where formal collection and treatment are not taken into account, there is even random incineration or landfill [1], resulting in more serious air or groundwater pollution, as shown in the figure 1.

![Pedestrian tree scene after typhoon](image)

**Figure 1.** Pedestrian tree scene after typhoon. (Pruning can also be reused at ordinary times of about 300 tons of street trees per month).

For the treatment of green waste, some developed countries, such as the United States, Japan and the European Union, have legislated to scientifically classify and collect waste, set up large compost fermentation plants for waste resource utilization, and carry out scientific and standardized management. In terms of resource utilization technology, companies in Germany, Switzerland, Belgium and other countries have mature organic waste treatment processes, and waste resource utilization has reached a certain level of industrialization. Norway’s hazardous green waste disposal from 1995 to 2011 accounted for, as shown in figure 2.

This study takes the carbonation and upgrading technology of street tree waste as the main purpose, which can replace the current method of using petrochemical materials to extract “carbon”. This technology can not only convert the waste into environmental protection material, achieve the effect of waste regeneration, but also greatly reduce the production cost by about 50% [2-3], improve the charcoalroasting process, and use the road tree waste to create conductive “conductive carbon”. After graphitization, it is applied to the science and technology industry and supports the technological transformation of traditional enterprises.
The objectives of this study: (1) Turn abandoned resources into treasure. Through the terminal treatment in the later stage, the green garbage will be decomposed scientifically, the utilization rate of resources can be reasonably improved, and the recycling of resources can be realized. (2) It is conducive to the transformation and upgrading of enterprises and increase the demand for employment. (3) Reduce the cost of transportation, stacking green waste and disposing of load.

2. The Design and Planning of This Study
The treatment technology of state and the recovery of garden greening waste can solve the pollution of greening waste. The effective application of this series of organic compounds to garden cultivation matrix, covering garden materials, improving soil reagents, research and development of organic fertilizer and other products has a broad market prospect. In order to realize the reasonable and healthy development of garden greening and the application of garden greening waste resources and zero discharge greening waste here [4-5], Atention must be paid to the effective treatment and application of greening waste.

After the entry into force of the “Kyoto Protocol”, there has been explosive growth in the global carbon trading market. Carbon trading volume jumped to 2.7 billion tons in 2007 from 1.6 billion tons in 2006, an increase of 68.75 percent. Turnover is growing more rapidly, the value of the global carbon trading market reached 40 billion euros in 2007, up 81.8 percent from 22 billion euros, and the total value of the global carbon trading market in the first half of 2008 was even the same as that of 2007 as a whole. According to global bank statistics, the global carbon trading market reached $150 billion, surpassing oil delivery. Easy to become the world’s largest market. The global carbon market will reach $3.5 trillion by 2020, according to a forecast released by New Energy Finance [6-7].

Primary burning carbon part, Johnannes Lehmann of Cornell University, a staunch supporter of biochar, published a new book which called “Managing the Environment with Biochar” [3]. Optimistically estimates that biochar can absorb up to 1 billion tons of greenhouse gases a year, more than 10 percent of the 8.5 billion tons emitted in 2007. This potential, unique, and even mysterious feature of biochar makes it. Therefore, the initial carbon burning technology will be introduced into the application of carbon black in bio-carbon market (such as carbon rubber, tire, soil improvement), and air pollution caused by a large number of carbon emissions will be reduced at the same time. As shown in figure 3.

3. Analysis of Energy Saving and Carbon Reduction
The preliminary experimental data show that the recovery rate of traditional incineration carbon is less than 15%, and the NPG-SD (Non Protective Gas-ShinnDar Wu Ph.D. developed an innovative sintering technology in 2008, referred to NPG-SD) of the innovative process of this project increases the carbon recovery rate by about 98%. Compared with the traditional carbon recovery rate of 83%, the maximum
benefit of energy saving and emission reduction can be achieved by saving 10% of the reaction energy in the sintering process, and cost can be reduced by about 3%, as shown in figure 4.

![Image](image_url)

**Figure 3.** Reform of street tree particles and street trees.

![Image](image_url)

**Figure 4.** Flow chart of the overall experimental scheme.

4. Results and Discussion

4.1. Sintering Results
The recovered corridor tree was shredded and sintered under unprotected gas by NPG-SD technology, which was first burned by 400 °C-500 °C and refined with 800 °C-1000 °C. The sintered samples were shown in figure 5. The conductive carbon resistance after fine firing is measured at 1.3 ohms, as shown in figure 6.

4.2. The Application of a Line Tree to a Lead-Carbon Alloy
Traditional carbon and its compounds are widely used. Graphite and clay can be mixed into pencil core for writing and painting. Graphite can also be used as lubricant, pigment, mold material in glass production, electrode in battery or electroplating and electroforming, carbon brush in motor and neutron reducer in nuclear reactor, etc. One of the main developments in this study is that the carbon material
formed by carbonation of pedestrian tree waste can be strengthened for plastic to produce light composite materials. Therefore, this study introduces fine carbon burning technology (NPG-SD): lead-carbon alloy, green process design of chemical cell, fuel cell and electro thermal material technology with industry foresight, and greatly reduce air pollution caused by raw materials and emissions, as shown in figure 7.

Figure 5. Recovery of initial burning samples of street tree waste: (a) 400°C-500°C initial firing sample diagram; (b) 800 °C-1000 °C fine burning sample diagram.

Figure 6. Measurement and analysis of conductive carbon resistance.

Figure 7. Lead-carbon alloy samples.

5. Conclusion
In this study, low temperature carbon and high temperature carbon were modified from street tree garbage collection and reuse, and a large number of storage problems after plant pruning were also solved. NPG-SD technology in this study made plants more valuable, and then completed the following
advantages of the preliminary research and development results:
(a) Reagents for improving soil, such as figure 5 low temperature carbon, will be developed for organic fertilizer, feed and other products.
(b) The conductive carbon part is shown in figure 5. The high temperature carbon treatment method will be introduced into the battery anode material in the future.
(c) The preliminary results are as follows: making plant carbon from street tree and synthesizing lead-carbon alloy, so as to improve the stability of the grid.
(d) This sintering technology uses unprotected gases to greatly reduce sintering costs.
(e) Tail gas collection reduces environmental pollution.

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