

Waste plastics Carbonization system

&

power saving CO₂ save Non-combustible carbon sheet



OHGI TECHNOLOGICAL CREATION CO.,LTD

Company Profile

Our high-quality activated carbon is introduced on the website of Swiss Embassy (2017.10.26)
https://swissbiz.jp/business-opportunities/?et_fb=1



Enterprise for the development and manufacture of carbon products



OHGI TECHNOLOGICAL CREATION CO.,LTD

Head Office

4-13, 3-chome, Nakano, Otsu City, Shiga
Prefecture 520-2114
TEL: +81 (0)77-549-1309

Founded

CEO

Number of employees

Capital

April 1, 1970

Takehiko Ohki

18 people

70 million yen

In-house equipment



- Nanofiber manufacturing device
- Collection machine
- High speed camera

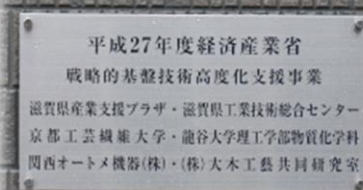
High Technology
Research building



- Nano carbon fiber
Carbonization furnace
Hybrid high temperature
firing device (3,000°C)



Inspection room



Conference room

OHGI Carbonization plant in Sanuki City, Kagawa Prefecture of Laboratory



Production Plant

PET-derived activated carbon Plant,
Sanuki City, Kagawa Prefecture



Laboratory of Shiga

REC 310, Seta Campus, Faculty of Science
and Technology, Ryukoku University



Plant facilities

Acquired 3 patents

4266711, 4308740, 4787968

Applying for PCT



Specific surface area measuring device



Particle size distribution measuring device



Digital microscope



Two microwave activation furnaces



Raw material feeding device



Outdoor exhaust gas and wastewater treatment

Plant facilities

Acquired 3 patents

4266711, 4308740, 4787968

Applying for PCT



Hybrid carbonization furnace



Exilant gas and treatment equipment's placed outdoors



Jet mill grinding machine



Control panel



Rotary kiln furnace



Cleaning Plant

Company Profile

AWARDS

- Class 2 Medical Devices Marketing License (Permit number 25B2X10007)
- Medical Devices Marketing Registration (Registration number 25BZ200034)
- Designated Rank A by the Kyoto City Venture “Mekiki” Committee
- Kyoto Oscar Certification System
- Ministry of Economy, Trade and Industry Authorization of the Driving Company for the regional future (2017)
- Co-sponsorship of Japan Patent Office, Ministry of Economy, Trade and Industry / Japan Patent Attorney's Association Encouragement Prize for IP Utilization, IP Strategy Section



Kansai Manufacturing New Selection 2018 Certificate

Obtained a Patent (including overseas)

- Patent **67 cases**
- Applying **49 cases**
- Trademark registration ... **37 cases**
- Design registration..... **13 cases**
- Practical model registration ... **12 cases**

Total **178 cases**

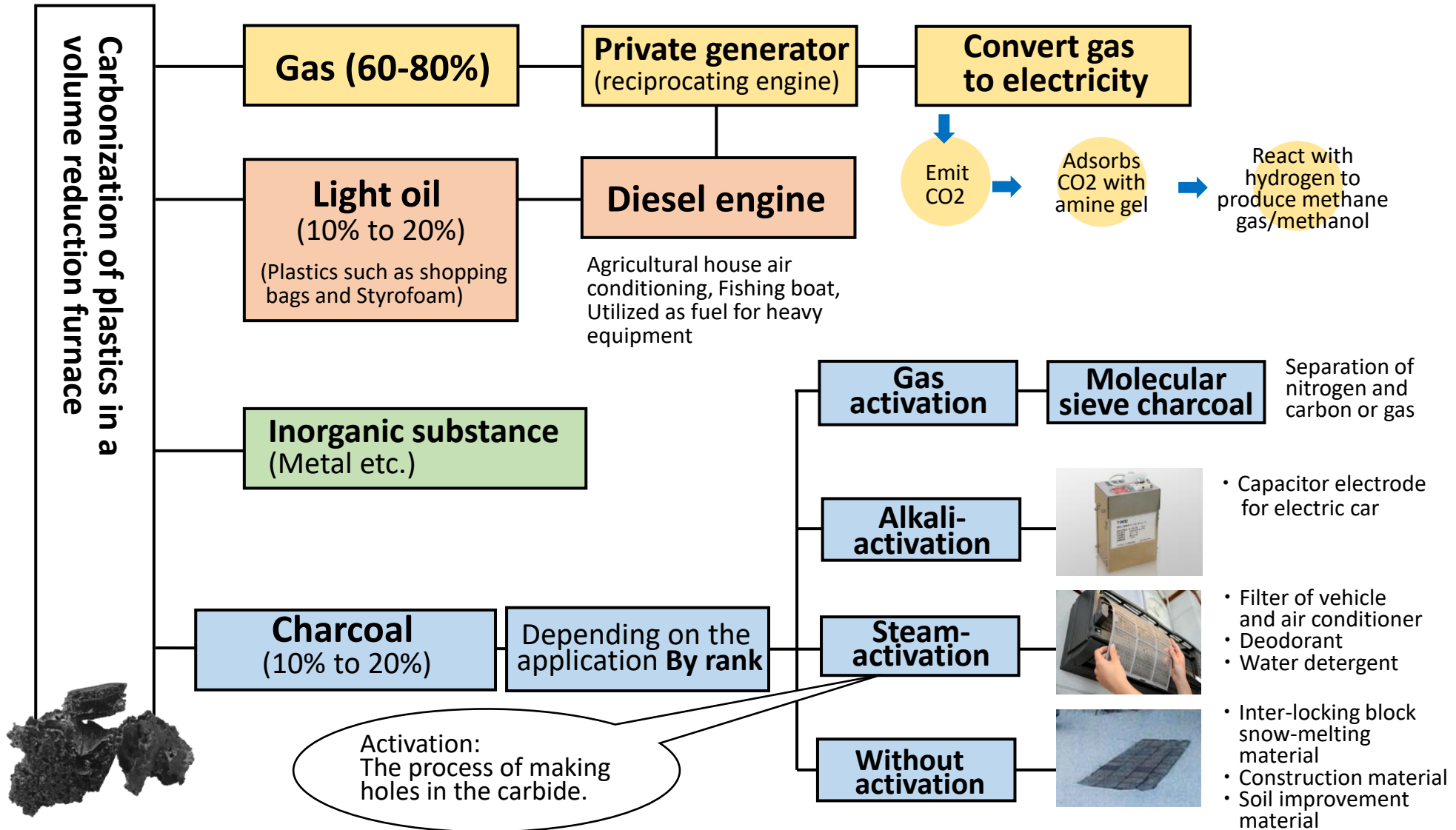


地域未来牽引企業



Certificate of selection for future company

Waste plastic volume reduction furnace system



Waste plastic type



A Rank (Recycled PET bottle)

Applicable for activated carbon for electrode material as almost no materials beside PET bottle have not been contained. Specific surface area is 3,000 to 3,600m²/g, highest-grade of all ranks.

Materials other than PET:
Approx.5%



B Rank
(Recycled PET bottle/Waste plastic)

Other materials than PET are slightly contained. As activated carbon, the performance is inferior to A rank products, but is applicable for air conditioner, filter of vehicle and deodorant.

Materials other than PET:
Approx.10 to 30%



C Rank (Mix plastic)

Plastic other than PET and resin are considerably contained. At present, 80% of such waste are incinerated or buried in the ground at cost. These materials are applicable for block, wall material and soil improvement.

Materials other than PET:
Approx.40 to 80%

Gas processing flow image

Livestock farmer



Cow manure



Food residue

Food processing factories, restaurants, etc.



Adjusting tank
Acceptance of waste



Fermenter
Gas holder
Hot water circulation device



Facility gardening, etc.



Heat supply

Power supply



Rice farm / farm

Liquid fertilizer compost

Becoming "Plastic soup Ocean" due plastic diffusion. Without effective quantity of "plastic" in ocean will

to the growing abuses of waste countermeasures, the total exceed that of fishes by 2050.

Urgent Issue

<Formation mechanism of micro plastic>



DATA

- Total worldwide production quantity of plastic since 1950 = **8.3 Billion tons**, **6.3 billion tons of plastic** have been discarded, which remains after thousand years without decomposed.
- Annual discharge amount of plastic waste to the oceans = **8 million tons**
- Estimate accumulated amount of discharge plastic waste = **150 million tons**

Discharge to the oceans

Decomposed by ultraviolet light and crashed by waves, micro plastic is formed, then drifted in sea and is piled up on the sea-bottom

- Estimated existing amount of micro plastic (fine plastic less than 5mm of diameter) in oceans = **5 trillion pieces**
- Micro plastic was detected from **80%** of anchovy caught in Tokyo Bay on 2016.

Harmful effects to ecological system.

The harmful substances concentrate and accumulate still more inside of fish and shellfish through ecological cycle.

The piled up micro beads absorb harmful substances.

Fishes prey on micro plastic mistaking for food.

The micro plastic absorbs harmful substances like PCB existing in sea and on sea-bottom, and has serious effect on ecological cycle of fish and shellfish through food-chain by building-up such harmful substances inside them.

The ocean contamination is just a case of environmental contaminations. Now is the time to stop the contamination by utilizing "High performance activated carbon"

(*American Research Team Outlook)

Marine plastic carbonization (Including micro beads)

Plastics of 5 mm or less that are finely decomposed by waves or ultraviolet rays in the sea and cosmetics The scrubbing agent contained in toothpaste was washed away in the sea.



Before carbonization 50g



After carbonization 10.2g



Before carbonization 50g



After carbonization 8.2g



Before carbonization 50g



After carbonization 9.1g

Waste plastic charcoal (High-performance activated carbon)



Processed into powder



Processed into powder



A Rank carbon

less than 10 μ
Specific surface is 3,000 to 3,600m²/g.

Alkali activation
Uses: Capacitor electrode for electric car

B Rank carbon

30 μ to 60 μ
Specific surface is 1,000 to 1,800m²/g.

Steam-activation
Uses: Filter of vehicle and air conditioner Deodorant / Water detergent

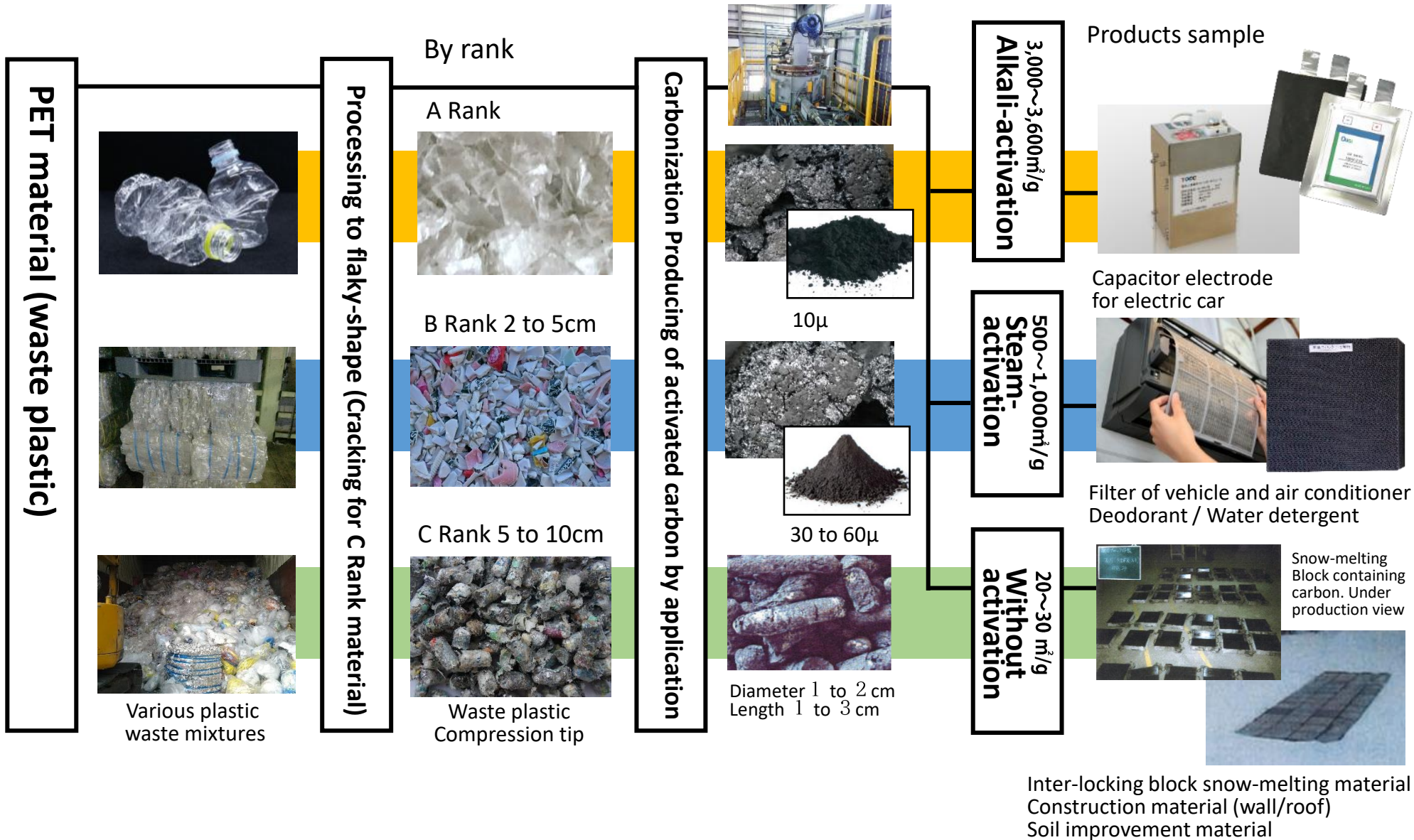
C Rank carbon

100 μ to 300 μ
Specific surface is 20 to 30m²/g.

Uses: Inter-locking block snow-melting material
Construction material (wall/roof)
Soil improvement material

Until high-performance activated carbon

Acquired 3 patents
4266711,4308740,4787968



Activated carbon for Rapid charging/discharging capacitor

In 2015, our EDLC project was recognized as “Strategic Foundational Technology Improvement Support Operation” appraisal result

With current electrodes Compared with the same volume **About twice** the discharge capacity



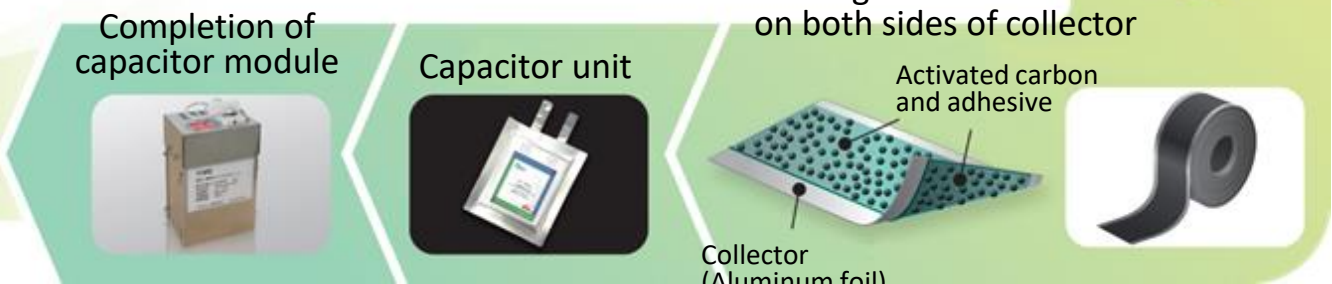
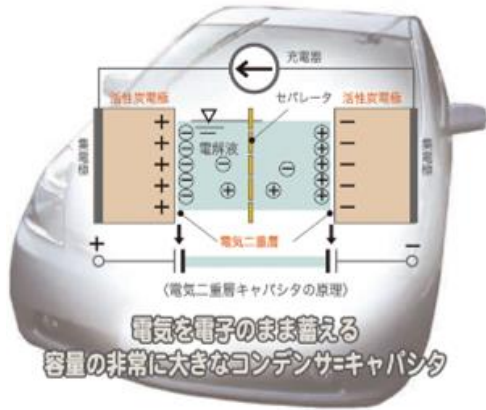
Completion of High performance activated carbon

Main uses of activated carbon

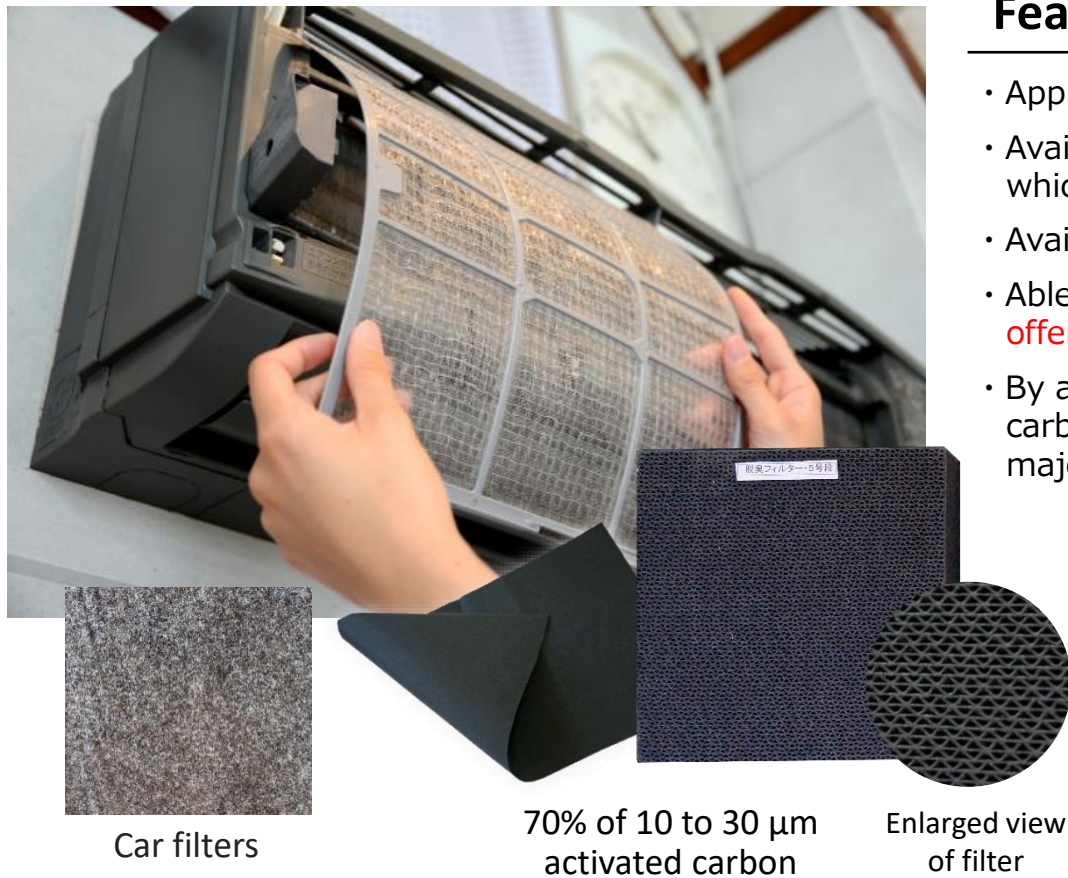
- High performance catalyst
- Fuel cell electrode material
- Hazardous substance adsorbent
- ...etc.



Application



Deodorant filter



Car filters

70% of 10 to 30 μ m
activated carbon

Enlarged view
of filter

Features

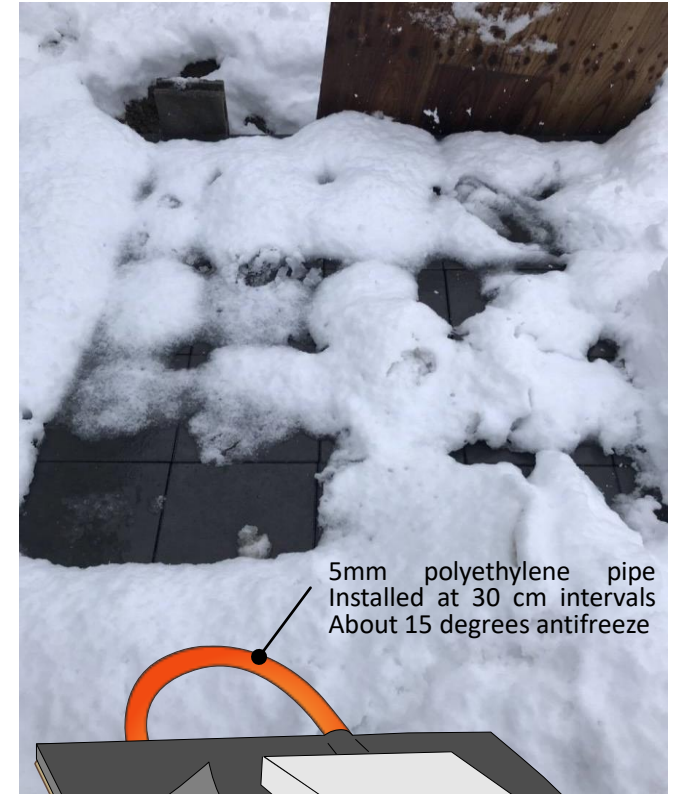
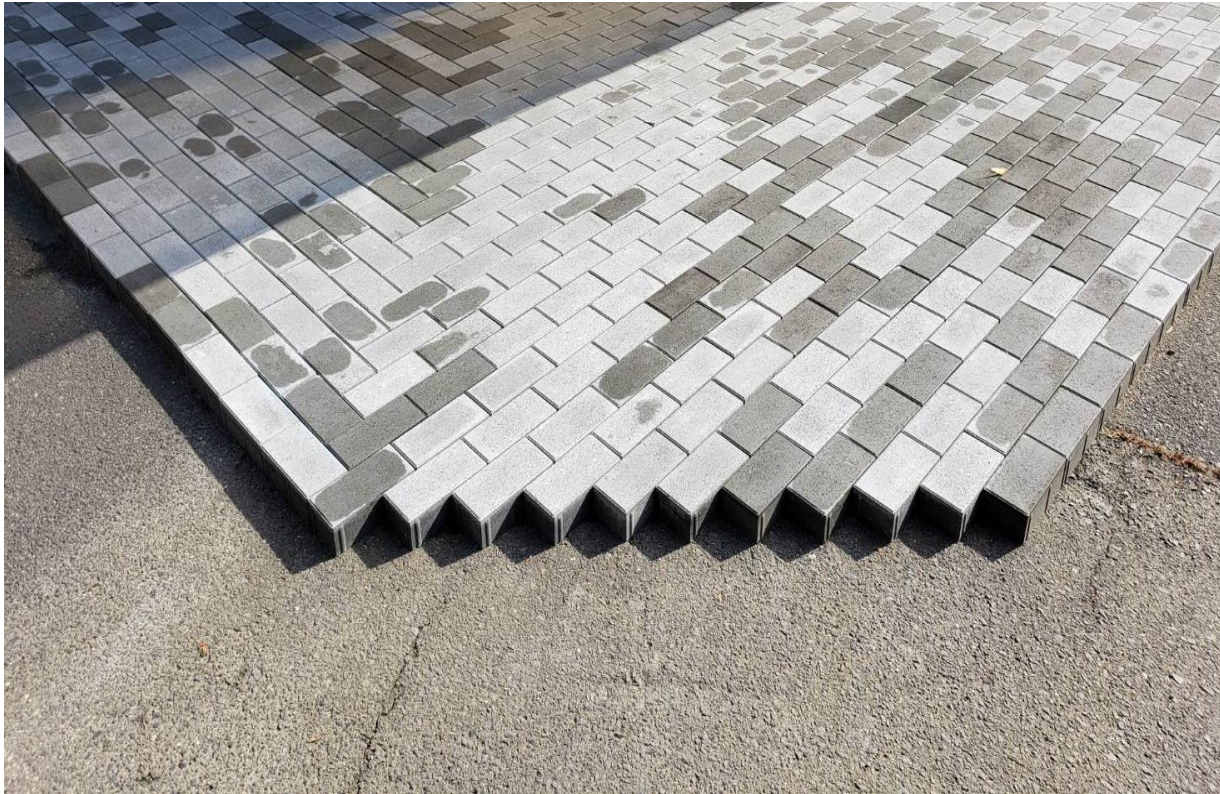
- Applicable to add suitable deodorant function to specific odor.
- Available processing of any shape of holes and layers which are suitable to specific shape of the passage of air.
- Available any size of filters suitable for the application.
- Able to deodorize more than **90% of four major offensive odors within 30 minutes.**
- By applying synthetic enzyme into pore of activated carbon, able to absorb and decompose the ten major offensive odors describing below.

項目		DC1412活性炭 (木質炭)ヤシ殻	PET再生炭
乾燥減量	%	48.7	46.7
充填密度	g/ml	0.4	0.2777
粒度(～0.075mm)	%	4.5	0
粒度(0.075mm～)	%	95.5	100
PH		9.8	7.1
よう素吸着性能	mg/g	1000	2160
メチレンブルー吸着性能	ml/g	170	230
カラメル脱色性能	%	-	97.5

JIS-K-1474準拠

Ten major offensive odors	Tobacco odor		four major offensive odors			Fishy odor		Aging odor	Excrement odor	VOC
	Acetic acid	Acet aldehyde	Ammonia	Methyl mercaptan	Hydrogen sulfide	Trityl amine	Viridine	Nonenal	Indole	Form aldehyde

Snowmelt block construction experiment



This photo shows the snow-melting blocks manufactured in Nabari City, Mie Prefecture and installed in the parking lot of an automobile dealership in Hikone City, Shiga.

The snow, that had twenty centimeters deep, melted immediately. (December 2018)

The use of heat exchangers is also effective in preventing summer heat islands.

Carbon sheet (100% carbon)

Thermal conductivity in the plane direction $500\text{W/m} \cdot \text{k}$

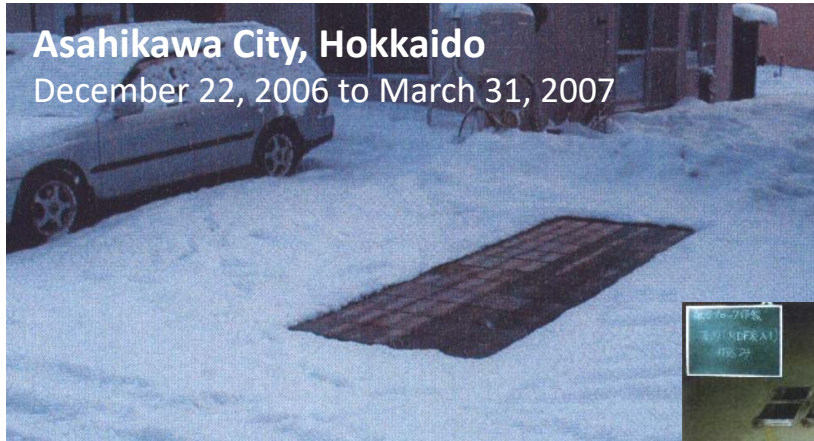
Snow melting block

Waste plastic C rank
About 20% of waste plastic charcoal is mixed

Carbonization and reuse of waste Construction example (1)

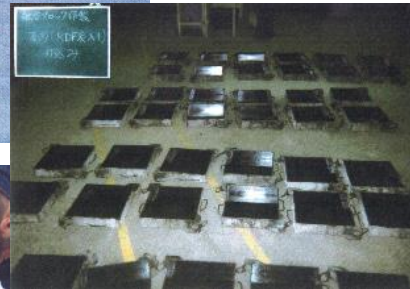
Obtained joint application
patent with Ryukoku
University 5294539

Research and development of snow melting
roof tiles and snow melting blocks



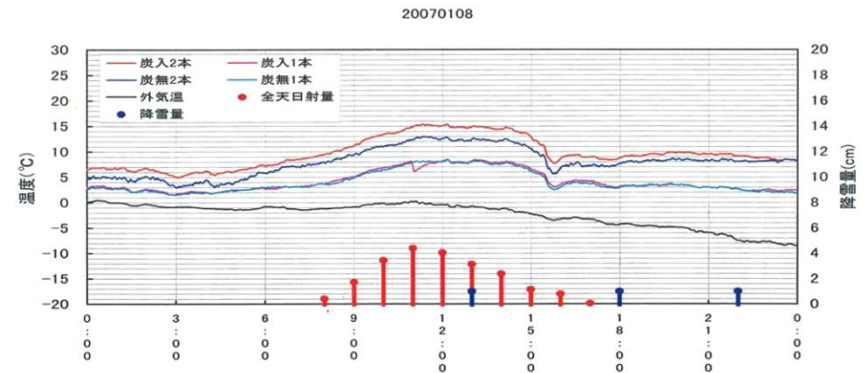
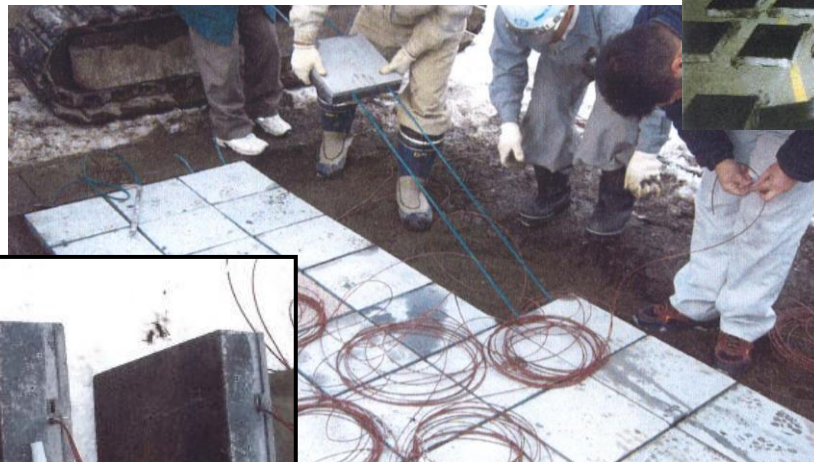
Effect

**Snow melting system on the roof
in cold regions
Mitigation of road surface freezing.
Heat island control method with
heat exchanger.**



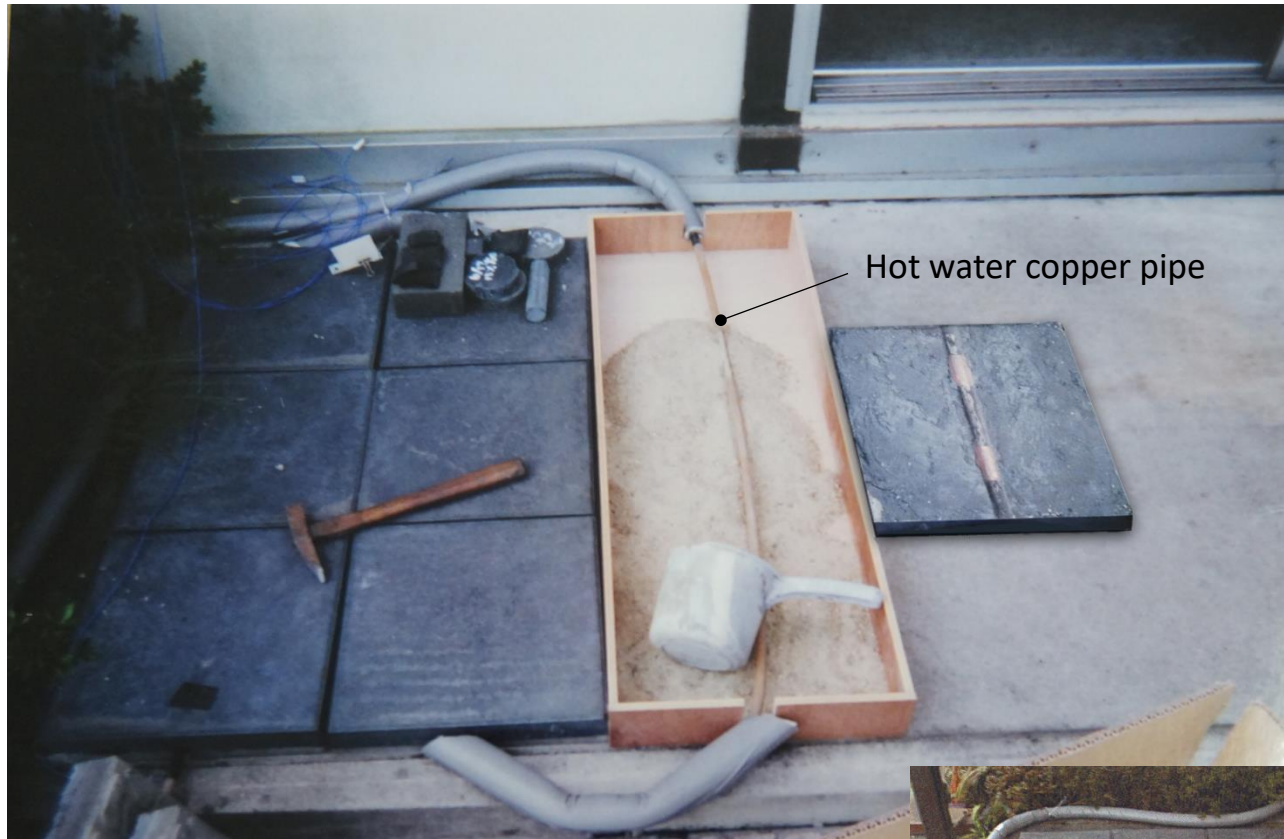
We have developed a building material that has a snow melting function by adding heat dissipation effect due to the thermal conductivity of carbon.

The mixed carbon is produced from waste, and this technology also contributes to the effective use of resources.



Carbonization and reuse of waste Construction example (2)

Obtained joint application
patent with Ryukoku
University 5294539



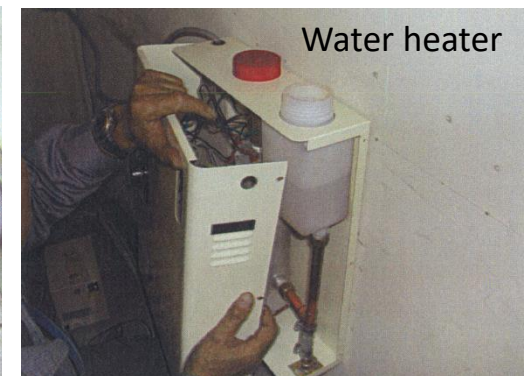
Hot water copper pipe



Authorized as primary special
zone of “South Lake Biwa Area
New Industry Creation Special
Zone Project”

Charcoal interlocking block

Hot water passes through the copper tube
Heating test with hot water
(Nine blocks containing 15% charcoal was used.)



Carbonization and reuse of waste Construction example (3)

Obtained joint application
patent with Ryukoku
University 5294539

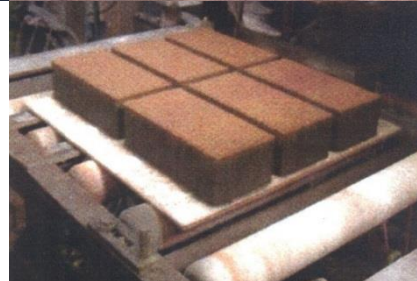
Trial at Kutsuki-Branch, Otsu City, Shiga

November 20, 2006



Eco charcoal block construction example

Examples of construction: Parking area of Aichi prefectural martial arts stadium



2008年(平成20年)6月30日(月曜日)

経 済 新 聞

第918号

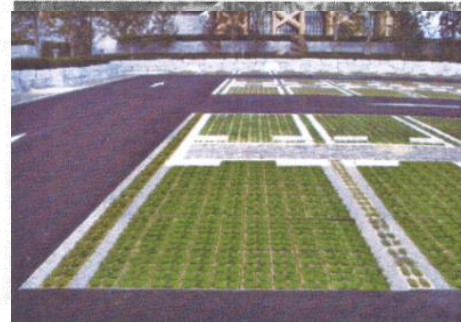
大木工藝

常緑芝付きブロックを開発

今秋までに本格販売

下水汚泥炭の利用拡大で

大木工藝(滋賀県大津市、大木武彦社長、☎077・549・1300)は「超保水 エコインターロッキングブロック」を開発、6月31日までに開催された「2008NEW環境展・東京(東京ビッグサイト東



施工例(愛媛県武道館駐車場)

再生製品の利用先が広がらず、困っていると聞いた。そこで、温暖化問題などをヒントに緑化基盤への利用に着目。常緑芝を植栽する

ホール)に出展、注目を集めた。下水汚泥を炭化、ブロックとして有効利用し、常緑芝を植栽した基盤を合体させたユニークさが主な理由とみられる。生ごみなどを炭化した製品はこれまでもあったが、ある自治体から、再生製品の利用先が広がらず、困っていると聞いた。そこで、温暖化問題などをヒントに緑化基盤への利用に着目。常緑芝を植栽する



Carbonized Sewage sludge

再生製品の利用先が広がらず、困っていると聞いた。そこで、温暖化問題などをヒントに緑化基盤への利用に着目。常緑芝を植栽する

自然の土のようで歩きやすく、学校のグラウンドやサッカー場などの緑化に最適」と話す。車道や歩道の基盤としても有効で、強度試験もクリア、懸念される重金属の溶出も国の試験をクリアしている。2006年には京都府環境保全公社の屋上に設置。2007年には、愛媛県武道館の駐車場(約600平方尺)に設置、省エネ効果などのデータを収集中。現在、大手セネコンはじめ数社から引き合いが来ている。同社は今秋までに販売提携先と契約し、本格販売を始めた考え。

Eco-carbon made from Sewage sludge

Roof floor of Kyoto Environmental
Preservation Public Corporation building

- We experimented with lawn and flower cultivation using sewage carbonized sludge during March to December of 2006.
In February 2009, our Eco-carbon tree-planting project was awarded as subsidized project of “Kyoto Environment Future Creation Project” from Department of Environment, Kyoto-City.



Eco-carbon for soil improvement materials

Rank C charcoal (sewage sludge, kitchen garbage, waste plastic reuse): Soil conservation, improvement, ecosystem conservation, water quality conservation, global warming countermeasures, building materials

PH controlling of soil
(Neutralization of PH/Weakly alkalization)

Improvement of water permeability of soil
(Preventing ground hardening)

Improvement of water retainability

Improvement of colonization of soil bacterium
(Suitable for organic farming)



← Ordinary ground Eco-carbon mixed ground →



← Ordinary ground Eco-carbon mixed ground →



← Ordinary ground Eco-carbon mixed ground →

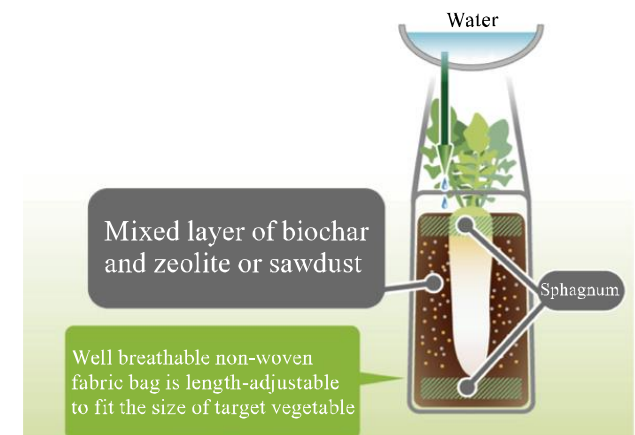
Constant dripping method organic and inorganic root crop cultivation system using Eco-carbon

Technology Subsidy” and involved 5 years experiment since March 2015.



■ Features

- Ecologically as using biochar recycled from waste
- Available cultivating with small amount of water, and all-weather type system realizes constant harvest amount.
- Easy indoor cultivating as no soil controlling is required.
- Applicable both to organic and inorganic cultivation



We made a joint press announcement with Ryukoku University about carbonization of waste plastics.

December 3, 2018 Kyoto University Centennial Clock Tower Memorial

We made a presentation on the result of industry-academia collaboration under the theme of “Carbonization of waste plastic and energy-saving carbon sheet.” and “Process of carbonization of waste PET bottles” with Professor Aoi, Faculty of Science, and Engineering



Carbonization process of waste PET bottle.



Press release on carbonization of waste plastic

2019年(平成31年)1月10日(木曜日)

プラごみで活性炭

プラスチックごみによる海洋汚染が深刻化する中、廃プラスチックから通電性がある活性炭を作っている大津市中野のメーカー「大木工業」に、注目が集まっている。環境にやさしく、しかも従来品より高性能であるとして、国内外大手企業から依頼が相次ぐ。電気自動車EVやエアコンの部品として、活用が期待されている。(作山哲平)

大津の大木工業



廃プラスチック片を焼く大木工業で、活性炭作つたフィルタ。右が代表取締役の大津市の龍谷大龍田キャンパスで、左が副代表取締役の大津市の龍谷大龍田キャンパスで。

通電性や消臭性 EV、エアコンへの活用期待

プラスチックごみによる汚染は、琵琶湖でも報告されている。県が二〇一五年にまとめた琵琶湖湖中の漂着物調査によると、漂着物の35%がプラスチック類だった。京都大の田中淳平准教授(環境工学)らのグループの研究によると、琵琶湖の水中からも微細プラスチックが浮き出ている。また琵琶湖で採取した魚のうち、約二割の体内から微細プラスチックが見つかったという。プラスチックは、ポリ塩化ビフェニル(PCB)など水中の有毒物質を吸着しやすいことから、悪影響が懸念されている。

民間企業によるプラスチックの減量を始めている。大津市におおのびのび湖大津プリンスホテルは四月一日から、レストラン、宴会場でプラスチック製のストローを廃止するとしている。

琵琶湖でも汚染を確認

などの差廃を目指す方針を明らかにした。



の、電動の重機では、国内で実用化が始まっている。昨夏から重用EVVの活用を見据えて、中国の化学関連大手「シンケム」から十億円で技術提供を求める依頼があった。

平成30年(2018年)12月12日 水曜日

産経新聞



廃棄プラスチックからつくった活性炭(手前)について説明する大木工業の大木武彦社長(右)と龍谷大の青井教授(左) 京都市左京区

廃プラスチックを炭素化 新たな活用策

壁紙や節電シートに再利用

龍谷大と大木工業 手法を確立

ペットボトルのみから活性炭を作り出す技術はすでに実用化されているが、今回はペットボトルだけでなくプラスチックや樹脂も含む廃プラスチックや活性炭を作り出し、再利用する手法を確立した。

プラスチックは炭素や水素、添加物でできているが、水蒸気を当てることで炭素以外の物質を除去する。こうして作られた活性炭を消臭剤や融雪材の製造に使用できるようになっていく」と話している。

また、壁紙や保冷車に使われる同社の節電シートにこの活性炭を活用することで、熱伝導効率の向上やコストダウンにも成功。冷暖房効果を最大限に生かし、環境負荷を低減することに繋がった。

龍谷大の青井芳史教授は「廃棄物を付加価値の高い材料に変えて、新たな道をつくる」と話している。

を破る心の弱さを妖怪に見立て、太陽の光が妖怪を追い出し、正しい方向へと導く様子を表現したという。部長の2年生、松本梢さん(17)は「交通ルールを守る強い心を持ってほしい、という願いを込めました」と話した。作品は年末まで、南署1階のコミュニティ・ルーム内に飾られている。

交通安全展



力強く文字を言葉に合わせて

嵐山の混雑状況 ネット

府北部の「冬の味覚」

24年に

