

# Researchers make nanostructured carbon using the waste product sawdust

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Chemists at the University of Birmingham have found a new way to make nanostructured carbon using the waste product sawdust, according to research published in the Royal Society of Chemistry journal *Green Chemistry* today.

By cooking sawdust with a thin coating of iron at 700 degrees centigrade, the researchers have discovered that they can create carbon with a structure made up of many tiny tubes. These tubes are one thousand times smaller than an average human hair.

Scientists are looking for new ways of making [carbon nanomaterials](#) as they can be expensive and difficult to manufacture. Carbons with a very specialized structure have many different applications, for example,

carbons with very small pores are used in water treatment for removing pollutants and in soil remediation where they can help to retain moisture and nutrients. More advanced carbons are finding use in batteries and may also be used in future hydrogen-powered cars.

There are many different types of carbon nanostructure. The most well known is graphene, which has a shape resembling chicken wire – hexagonal mesh with a carbon atom in each corner. Carbon nanotubes are similar – they are made of layers of graphene rolled into tubes. The organized shape of these materials means that they have exceptional properties such as conducting electricity, however they are expensive and difficult to make on a large scale. The challenge now is to make carbons with similar properties, but in a much simpler way.

Sawdust is made up of fibres of cellulose and lignin, two of the main building blocks of all plants. When the whole surface of the sawdust is coated in iron nitrate and then cooked, iron carbide nanoparticles are produced. These tiny particles burrow through the structure of the wood as it is decomposing to carbon, leaving behind tubes of very ordered carbon resembling more conventional [carbon](#) nanotubes.

Dr Zoe Schnepf, from the University of Birmingham's School of Chemistry, said: 'What is really exciting about this is that we are taking waste plant matter and making an advanced material. Waste from agriculture and industry is often costly to deal with, for example in landfill. Industry is becoming increasingly interested in adding value to this waste and creating something useful out of things that otherwise would have been burned or buried.'

Provided by University of Birmingham

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