Turning plants into plastic

A team of scientists from a Dutch university has discovered a way of turning gases made from plant matter into the building blocks of common plastics.

They used a new kind of iron catalyst made from nanoparticles to produce the alkenes ethene and propene from biogas (a gas made from plants). These hydrocarbons can be used to make the polymer chains that form plastics.

Alkenes are usually derived from crude oil, which is a non-renewable resource. However, this new method means that plastics with the same chemical structure, and therefore properties as traditional plastics, can be produced using biomass, a renewable resource.

Natural polymers, such as starch found in potatoes and corn, can also be used to make bioplastics. However, these have only limited use as they are not as strong and durable as petroplastics.

However, some people say that using biomass in this way is not as environmentally friendly as it sounds. Growing the plants takes up valuable space that could be used to grow crops to feed people. Also, forests might be cut down to make room to grow the plants.

The research, which is published in the journal Science, is still at an early stage. It now requires larger-scale testing, so it will not reach the market for several years.

1. By which process is ethene converted into a polymer?
2. Write an equation to show this and name the polymer formed.
3. Are these new plastics biodegradable? Explain your answer.
4. Are they sustainable? Explain your answer.
5. What are the benefits and drawbacks of these new types of bioplastics made from biogas?
6. What are the benefits and drawbacks of bioplastics made from starch?
7. Why did the team publish their research in a journal?