Ämnesprov, läsår 2016/2017

Chemistry

Årskurs



engelsk version

Elevens namn och klass/grupp



11. Research has shown that young people need to eat a nutritious diet to grow and develop. A nutritious diet has to contain different nutrients, for example: proteins, carbohydrates, fats and vitamins

Your task is to:	
Argue why it is important to eat a nutritious diet.	
Start from your knowledge about two of the nutrients: proteins, fat, carbohydrates and vitamins and reason in two steps.	

12. Graphene

Graphene was discovered in 2004 and is one form of the element carbon. Graphene consists of one single layer of carbon atoms. The carbon atoms are ordered in a pattern with six corners. The text is about graphene.



Source: Ny teknik (weekly magazine). Published 2012-05-15.

Researchers warn about the risks with graphene

The nanomaterial graphene might threaten our health and the environment. To not make similar mistakes as with PCB and DDT, a new way of thinking about risks is demanded. This is a claim, in a new report, of a researcher from Chalmers.

The use of the super-material graphene has only started. As products with the material are reaching the market, the production will soar.

"Graphene is a super awasome material, and now we have the possibility to implement risk thinking in time," Sverker Molander at The Division of Environmental Systems Analysis at Chalmers University of Technology says.

Together with his colleagues, he has evaluated possible risks with graphene, partly through discussions with graphene researchers, partly through a literature study.

The report claims that graphene, besides its desirable properties, also has properties making the material a possible environmental and health danger. Graphene is slowly corroding. Moreover, it is hydrophobic, which means that it is attracted to fat and thereby it might be absorbed by living organisms and then accumulate in the food chain. These properties are the same as for PCB and DDT.

Only a few studies have been done about graphene and its toxicity – at the end of year 2011 there were four published studies. Three of them were done on human cells and show that graphene can cause cell death and inflammations. The forth was done on bacteria growing on graphene. 87 to 95 percent of the bacteria died.

"Everything gets even more complicated since we do not know in which form graphene will be found in the environment. Will it be in the shape of sheets or as a more wrinkled structure?"

Graphene can also be coiled into carbon nanotubes used to produce mechanically strong composites. But carbon nanotubes have a shape and size reminiscent of asbestos fibre.

This has meant that environmental toxicologists at, for example, the Karolinska Institutet have become aware of them.

"There are several gaps in our knowledge that have to be filled when it comes to graphene. If you are aware of the risks, it is easier to design processes for production and future use within the industry in a way avoiding harm to the environment or our health," states Sverker Molander.

Your task is to:		
a)	Find scientific information in the text and state one disadvantage with graphene.	
b)	Start from the text. Reason about the text's credibility from two different perspectives.	

a)	
b)	

13. Biogas or biodiesel as fuel?

A municipality is going to buy new cars and choose between cars using biogas or biodiesel.

The choice of fuel can give both positive and negative consequences on the environment.

Facts about biogas

Biogas is produced through anaerobic digestion of food waste from households. The digestion process happens in a digestion plant. Through the digestion, biogas and biofertilizers are produced.

Energy content: approximately 20 MJ/kg

Facts about biogas

Biodiesel is produced from vegetable oils, for example rapeseed oil or palm oil.

Energy content: approximately 37 MJ/kg

Use the facts to write a text with the following parts:	
• A stance	
Taka a stance for biogas or biodiesel.	
Scientific reasoning	
Formulate two arguments in two steps presenting	
the fuel you have chosen	
and	
formulate one argument in two steps against one of the fuels.	
Scientific language	
Be objective and use scientific concepts in your reasoning.	

Take a stance:
Whrite your text:





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