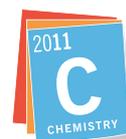




International year of Chemistry

# KEMINS ÅR 2011

An amazing year that has generated plenty of exciting and fun activities.



**KEMINS ÅR**  
**2011**



## Chemists are tomorrow's heroes

Chemists are seldom at the foremost when exciting new innovations are presented, despite chemistry is the solution for present and future challenges. During the Swedish part of International Year of Chemistry, KEMINS ÅR 2011, we wanted to show that chemistry, chemical engineering and chemical knowledge has a central role in creating good living conditions for the world's growing population and for sustainable development.

Twelve monthly themes were selected to display chemistry in our daily life, from art and clothing to food and medicine. Throughout Sweden, from north to south, universities, colleges, businesses, organizations and science centres organized activities that demonstrated the importance of chemistry.

Teachers and students have received new teaching materials, videos and training. The public has been invited to chemistry activities, lectures and open houses. The creativity has been high!

### Chemistry is the field of opportunities

Many of us know that chemistry exists all around us and has a lot of opportunities. Still the public image is that chemistry and chemical knowledge doesn't contribute to the society.

Why is it so important to change the image of chemistry?

Chemistry is creative science essential for sustainable development. Many of today's challenges, such as reducing greenhouse gas emissions and obtain food and clean water to the Glob's growing population, requires knowledge of chemistry. Chemical knowledge has been fundamental for many innovations that are found in our daily lives such as drugs, mobile phones and fuel-efficient cars.



Changing the public image of chemistry is more than a recruiting issue for universities and companies. With an all-round education that chemistry is important and can give solutions we provide scope for innovation. Then we can create a more sustainable society and meanwhile the business sector of Sweden can strengthen its international competitiveness.

### Chemistry is fun, future and sustainable development

Many people have contributed to make the Swedish celebration of International Year of Chemistry become a success. Despite different backgrounds and somewhat different motives, we have agreed that we all want to have an innovative and sustainable society. With a breadth of activities and information efforts, we have shown that chemistry has potential in the future.

The communication during the year was summed up in a few concrete messages; Chemistry is fun, important for the future and above all creating sustainable development. With chemistry, we solve current and future challenges.

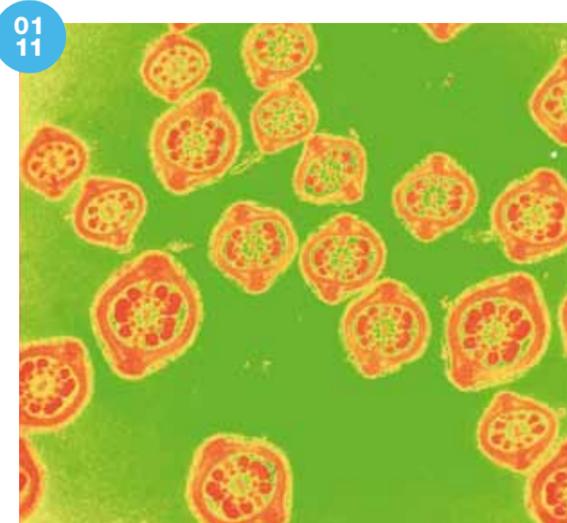
### International Year of Chemistry 2011 - A platform for the future

During the International Year of Chemistry 2011, we had possibility to spread the message that chemistry is the science of opportunity and that the world needs chemists who provide us with innovations. We all worked to raise awareness about that chemistry provides solutions to current and future challenges.

In this brochure we have compiled a sample of Swedish activities during International Year of Chemistry. Together we were able to give a positive and attractive vision of the future and of chemistry as an enabler. On 30 November we closed KEMINS ÅR, the Swedish part of International Year of Chemistry, with a workshop. Together we created a platform for our continued efforts to influence the perception of chemistry, chemical engineering and chemical knowledge.

# A theme for each month

Within the most diverse social functions knowledge of chemistry is required, although on a daily basis we may not think of it. In Sweden we have therefore chosen to organize activities during International Year of Chemistry 2011 around 12 monthly themes. Each theme is linked to some current events in society. Chemistry is everywhere!



## January - Art and culture

The art exhibition CHEMISTRY - no artifice! Vernissage at the opening ceremony of the Chemical Centre in Lund. The artworks are produced by scientists at the Chemistry Centre, Lund University.

See more artworks  
[www.kilu.lu.se/internt/kemins\\_aar\\_2011/utställning](http://www.kilu.lu.se/internt/kemins_aar_2011/utställning)



## February - Fashion

Fibre is a slender materia unit which is usually flexible. This slender, may be a single molecule, a group of molecules or a biological structure, often with a mechanical function.

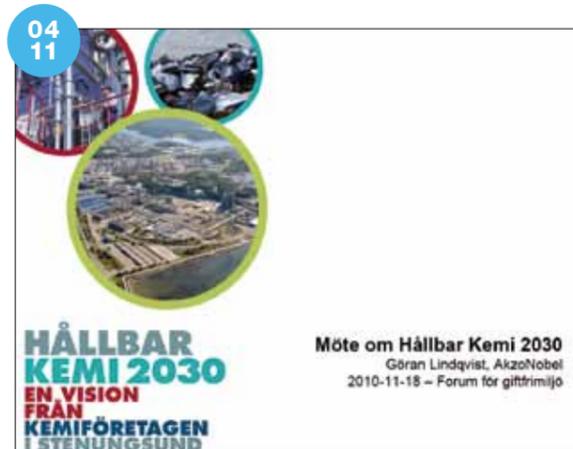
Chemistry Terminology Committee suggests the definition of fibre in an article about fashion in Chemistry World Biotech Chemical Magazine.



## March - Energy and Climate

- Energy for the world: research progress and future
- How will we feed the world with energy?
- What are the new energy technologies?
- What is the social and environmental impact of our everyday choices?

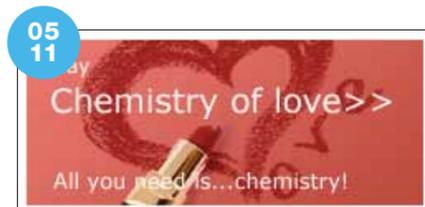
From the program, Panel discussion on energy supply in the society from a chemical perspective, Department of Photochemistry and Molecular Science in Uppsala.



## April - Industry

In 2030 Stenungsund will be the hub for manufacturing of sustainable products in the chemical industry. Our business will be based on renewable feedstock and energy and contribute to a sustainable society.

Science cafe on the vision Sustainable Chemistry 2030 from Chemical companies in Stenungsund



## May - Chemistry of love

"Perstorp can help with components in products that can help give love a helping hand, like cosmetics, perfumes, body- and hair-care products. One example is allyl ether, which helps lipstick keep its colour and to stay where it's supposed to. Quite important if the chemistry of love should get a little hotter!"

From Perstorp's website,  
[www.2011.perstorp.com/Monthly-Themes.aspx](http://www.2011.perstorp.com/Monthly-Themes.aspx)



## June - Water and Air

Water is beautiful, useful and valuable. During International Year of Chemistry school children throughout the world explored the planet's most critical resource, water. A Swedish translation of the instruction for the chemical experiments is available on Swedish IYC website.

[www.kemi2011.se/content/det-globala-vattenexperimentet](http://www.kemi2011.se/content/det-globala-vattenexperimentet)



## July - Sustainability

Chemistry lessons for primary school is a new teaching material for grades 4-6. There is one lesson for each monthly theme. The material is adapted to the new curriculum in force from autumn 2011. In July's lesson, students learn that it is better to recycle materials than to throw it, be it in nature or in landfills.

Download lessons, [www.lektion.se/lektioner/lektion.php?id=18077](http://www.lektion.se/lektioner/lektion.php?id=18077)



## August - Chemistry in sport

Actually we have quite a lot of energy in the body, but almost everything is stored in the form of carbohydrates, fats and protein. Most of the carbohydrates of the antibody are bound in the form of glycogen, a macromolecule having up to 30 000 glucose units.

From 42 195 metres of biochemistry, one of a series of articles published by Chemistry World Biotech Chemical Journals on the occasion of International Year of Chemistry.



## September - Communications

The ninth film in the series Chemistry Calendar 2011 explores why Silicon Valley, the very symbol of modern communication technology, is named after one of the elements in the Periodic Table.

Chemistry Calendar launched one movie every month on YouTube, [www.youtube.com/kemikalendern](http://www.youtube.com/kemikalendern).



## October - Health

Considerable amount of chemistry is needed to keep clean in a house. Clean Right, a website with information on laundry and cleaning products, can be used in home economics and chemistry teaching in primary schools.

Clean Rights website, [uk.cleanright.eu](http://uk.cleanright.eu)



## November - Food Chemistry

Everyone has a lab at home - the kitchen! "The chemistry has helped us understand how we break down and assimilate nutrients in food. The chemical factory that is our digestive system is more complex than anything man has built himself!"

From Mats Linder's article on the KTH Royal Institute of Technology website, [www.kth.se/che/kemi2011](http://www.kth.se/che/kemi2011), where there is also the Month chemist, Molecule of the month and the Month material.



## December - the history of chemistry and Nobel

Already in 1867 Alfred managed to master the problem of nitroglycerin shock sensitivity. When he mixed nitroglycerine with diatomaceous earth to make dough that could be shaped into sticks, dynamite cartridge, he received an effective explosive that could be handled quite safely. Thus began the transformation of our planet. It became possible to build tunnels right through the great mountains, channels and rock shelters.

From the Chemical History Board Text of December, [www.kemi2011.se](http://www.kemi2011.se)

# From north to south

During the whole International Year of Chemistry fantastic activities with chemical connections were organized by universities, colleges, businesses, organizations and science centres in Sweden. Across the country we have shown the Swedish people what chemistry is all about. We are numerous who have helped to demonstrate the possibilities of chemistry.



**Stockholm City Hall** Grand opening ceremony KEMINS ÅR 2011, Swedish part of International Year of Chemistry.



**Open House of Industry park Helsingborg**  
Chemical companies showed their operation to the public.



**Culture Night in Lund**  
Pipetting competition. One of many examples were chemistry activities were included in other already established events.



**Researchers' Night Umeå**  
Visitors could learn more about forensics, visiting scientists' laboratories and try to experiment.



**In Uppsala** there was chemistry on both streets and market-places



**Calendar Chemistry** Most innovative and striking Swedish activity during International Year of Chemistry 2011!

**WINNER!**  
GOTHENBURG



**Björkborn Manor Karlskoga** The Swedish Chemical Society in Bergslagen invited 300 students to Chemistry Show and meeting with Alfred Nobel (Peter Sund).



**KomTek Örnköldsvik**  
A nursery for aspiring scientists, engineers and innovators.



**14-15 October - Chemistry Day throughout Sweden**  
110 000 students made their own paint. Open House at several companies.



**Uppsala** launched a brand new pastry on the occasion of International Year of Chemistry. Celsius tart, chocolate base, raspberry truffle and milk chocolate mousse.



**Vattenfall rock shelter Stenungsund**  
Chemistry in the Hall of the Mountain King. 25 exhibitors, 1 200 visitors.

**Älvkulle gymnasiet and Karlstad University**

Four young people within the science program in Karlstad made a humorous Christmas calendar with chemical experiments.

[www.youtube.com/user/Kemijulkalendern2011](http://www.youtube.com/user/Kemijulkalendern2011)



**Gotland Museum of Art and Fenomenalen science centre in Visby**  
Art + chemistry = true! Interdisciplinarity at its best.



**Dragon girl Berta and Anna Gunnarsson** toured and visited 14 places around Sweden. Preschool children and their teachers were allowed to try easy chemistry.



**Food and molecules in Lund**  
Food exhibition with chemical touch.



**Bubble Blower Festival Stenungsund**  
122 people in a soap bubble. World record!

On this spread, we show images from a selection of all the over 300 activities held in Sweden during International Year of Chemistry 2011. More pictures available on [www.kemi2011.se](http://www.kemi2011.se)



**Chemistry Day in Sundsvall**  
Open house at Akzo Nobel in Stockvik

# International Year of Chemistry - A platform for the future

On 30 November 2011 the Swedish part of International Year of Chemistry was summed up. It was a day dedicated to chemistry at the Royal Academy of Sciences in Stockholm. We discussed how efforts made could be a platform for the future and organised a big workshop with focus on how to create curiosity in chemistry and influence young people's attitudes.

The participants represented universities, colleges, businesses, organizations and science centres.



Welcome speech by Sture Nordholm, chairman Swedish National Committee for Chemistry.

Eva Åkesson, principal Uppsala University, presented the initiative taken by IUPAC resulting in the International Year of Chemistry.

In the exhibition we shared our best events and let us be inspired by some of the more than 300 activities arranged during the year.



Goran Rämne showed experiments with bubble blows.



During the year there were about 360 media reports about Swedish activities during, International Year of Chemistry. All articles were posted in the exhibition.

Stockholm University showed the Swedish contribution to the periodic system that was developed specifically for the International Year of Chemistry.



All contributed with ideas and then made notes about what they planned to do to realize the ideas.

## Dialogue sessions collected ideas

What can we, who represent chemistry in Sweden, do to influence the attitude of young people and increase their interest in chemistry? It was the issue discussed in the dialogue sessions. Many ideas came up and in a big final workshop the top 10 things were scored using "mentometer", electrical devices for measuring opinions and attitudes.

Eva Åkesson summarized the day and stated that there is now a positive momentum for chemistry. There are many good stories from the year and we have all cooperated and shared ideas and suggestions. Eva Åkesson wished that we all should continue in the same spirit, inspired by today's dialogue and realizes many of the ideas from the day.

The day finalized with that the National Committee for Chemistry promised to invite all that work for chemistry in Sweden back in a year and let this become a regular event. The meeting on 30 November became a starting point for an annual meeting, a platform for the future.

## What can we do to create curiosity in chemistry and influence the attitude of the young?

1. Get more good teacher in chemistry / science
2. Broaden the perspective, show the chemistry of non-traditional areas
3. Raise awareness among the public and dare to problematize
4. Break the stereotypes that chemistry is difficult, dangerous and dull
5. Show the width of the professional roles for chemists
6. Involve multiple actors (ICA, IKEA ...) not only the chemical industry
7. Listen to the young - to pique their interest
8. Just do (practice, discovering chemistry)
9. Show breadth and context (cooperate with other disciplines)
10. Link chemistry to industry and local environment and also digital chemistry



## Attracting young people today

**In the process of trying to influence attitudes it is important to understand the audience you want to impact. What do young people today bear in mind and how do we get them to be more interested in chemistry? How do we get them to want to stay in education or at a workplace?**

Those who are pupils today are everything from children born in 2005, just starting out in preschool class, to young people born in the 90's. Today's late 80's are almost done with university studies and the majority are already working.

To get an idea of what young people today bear in mind we invited an external speaker to the Swedish closure of the International Year of Chemistry. Marie Söderqvist, former CEO of research firm United Minds and author of the study "80's - so they function" has a broad knowledge of the generation that is young today. She believes that each generation is a coherent group characterized by for instance children's programs, policies, media, immigration, economic and labour market. All generations have so called generational trauma.

For people born in the 60 - and 70's was the Cold War a trauma, but for 90 baby-boom generation it is the terror bombing, the murder of the Swedish Minister for Foreign Affairs Anna Lindh in 2003, global epidemics, tsunami, climate change and especially chip alarm. 90 baby-boom generation grew up with the concept of "Cosy Friday" with chips and family starting the weekend together.

- Imagine then what unpleasant it must be to realize that the cosiest is also a carcinogen!, said Marie Söderqvist.

90 baby-boom generation is still young so we cannot draw so many conclusions, but Marie Söderqvist see some trends and call the 90's "self-imposed prefects." It may be a reaction to that youth today have so many choices, they are accustomed to seek order in their lives. Furthermore, this is the generation that brought up at day care and always received encouragement for everything they've done, every perler bead has been fantastic.

### **This generation's greatest desire in life is to**

- a) find the right job,
- b) find the right one and
- c) have children with the right one.

They are the first generation of all to have such basic desires, unlike the early 80's who want to travel, have many relationships, have a lot of experiences.

Young people today are skilled at using social media. They are both consumers and producers of the internet. As an employer, you win nothing by disallow Facebook in the workplace, says Marie Söderqvist. The Internet is their circulatory system, so to ban social media is just unnecessary, they will still find ways to communicate with their friends online.

Marie Söderqvist said that when she heard that we are working to link the words fun, future and sustainability to chemistry, she considered that they have the power to reach young people today. To have fun is important for the young generation and the future shall be about flexibility. An education is of interest if it leads to a breadth of jobs to choose from. As this generation grew up with the issue of sustainability, it is of course an important issue for them.

### **80's and 90's dreamjob**

1. Well paid 50%
2. Gives me new skills 39%
3. Engaging 37%
4. Flexible hours 36%
5. Challenging 29%

### **What do 80's and 90's want to have at work**

- Orderliness - but not stagnation
- Security - but not boredom
- Status - but not hierarchies
- Flexibility - but clear structure
- Openness - but with integrity

... And they want to be seen, seen, seen and have a good salary and good prospects.

### **Thoughts from a chemist**

Karolina Broman is a PhD candidate and teaches chemistry in teacher education at Umeå University. As part of the work for her upcoming thesis within the context-based chemistry teaching, she asked 500 high school students to specify what would make school chemistry more interesting and meaningful. The answer she got was more labs and more life-related teaching.

- It is important that the laboratory is not used to capture students' interest for a while before it is again time to talk about atomic structure or something similar. The laboratory work must be framed within a context and linked to what the teacher is talking about in the other classes, says Karolina Broman

## International Year of Chemistry 2011

United Nations designated 2011 as International Year of Chemistry. The year was part of the UN Decade for Sustainable Development and the purpose was to raise awareness of that chemistry and chemical knowledge provides sustainable solutions for today and for the future.

Swedish National Committee for Chemistry, a working committee under the Royal Academy of Sciences, is the principal of the Swedish celebration of International Year of Chemistry, KEMINS ÅR 2011. The coordination of the celebrations took place in a project group formed by the Swedish National Committee together with Swedish Chemical Society, the trade association Swedish Plastics & Chemicals Federation and the Chemistry Teachers' Resource Centre. VINNOVA, the Sweden's Innovation Agency, and the Swedish Research Council contributed financially.

Efforts to implement activities that show the role of chemistry has been organized by various actors throughout Sweden. Information about all activities is available on the overall campaign page [www.kemi2011.se](http://www.kemi2011.se).



SVENSKA NATIONAL-  
KOMMITTÉN FÖR KEM

