

welcome to issue 30

Welcome to the final frontier. This month we're getting lost in space! Chemistry is helping us to understand more and more about space, our planet and the universe it occupies. With the launch of the Herschel probe due this spring I have decided to take a look at the application of chemistry to the study of space. This edition of the newsletter has links to more information from the European Space Agency (ESA) and NASA about how they use chemistry. On a slightly different tack the study of the Earth's climate and atmosphere is a great example of using chemistry to learn more about our world and humanity's impact on it. Public interest in this area reached a peak with the discovery of the hole in the ozone layer in the 1980's, but work has continued since then looking at a wide range of issues including greenhouse gases and climate change. Much of this work is actually carried out from space, using satellites facing back towards Earth rather than out into the cosmos.



Robert Bowles – Editor



Atmospheric Chemistry



Fancy a career in chemistry that reaches for the heavens?

Atmospheric chemistry is hugely important to our understanding of the Earth and the thin, fragile layer of atmosphere that covers it and makes it habitable. Analysis of the atmosphere can provide a window into the past using ice-core samples, show us how we are altering the atmosphere at the moment and predict what might happen in the future. All of these areas of research use

sophisticated analytical chemistry techniques and offer real opportunities to be at the cutting-edge of science whilst contributing to the debate on really important issues such as climate change.



Website of the month

www.space.com

This site covers every "space topic" you can think of, as well as ones you probably can't! Is the methane recently discovered on Mars geological or biological in origin? Do a search of chemistry on the site and you get

back a meteor storm of stories that look at chemistry in space, including chemistry on Mars and the Moon. Stellar!

chemnet events

ChemNet events in 2009 can be viewed on the *ChemNet* events page. Just go to www.rsc.org/chemnet. Click on *ChemNet* events to see if there's a *ChemNet* event coming up near you. Here's a selection of the first ones:

What Chemistry has done for me – Careers in Chemistry event

The RSC, Cambridge
part of Cambridge Science Week
12 March

Lecture on atmospheric chemistry

The National Space Centre – Leicester
24 March

ChemNet meets ChemSoc Chemistry careers event
Sheffield University
31 March

Undergraduate taster day
Imperial College London
– limited to 30 places for *ChemNet* members
22 April

ChemNet visit to the Bank of England
Off Threadneedle Street, London
7 May

More information about these events and many more can be found on the *ChemNet* Events pages at www.rsc.org/chemnet. To book your place on any of them email us as soon as possible at ChemNet_events@rsc.org. *ChemNet* events are usually free to *ChemNet* members.

chemistry on the web

Much more information about the Herschel Telescope and the other ESA space projects can be found here: <http://sci.esa.int/science-e/www/area/index.cfm?fareaid=16>

The Aura Earth Observing System measures the chemistry of the Earth's atmosphere from space. <http://aura.gsfc.nasa.gov/>

UCL in London are researching the chemistry of space dust. There's a great summary of their work here: <http://www.chem.ucl.ac.uk/cosmicdust/>

An area of chemistry called green chemistry offers real hope for solving many of the world's major problems. Here's a blog about using chemistry for sustainable development; including postings on the environment and climate change. <http://greenchemistry.wordpress.com/>

The site also offers numerous links to other similar pages on the web and is very comprehensive.



Chemistry in the news



Lost in Space?

Since we first looked up into the night sky we have pondered the universe and our place in it, space has always fascinated humanity. Chemistry is now helping to fill in the gaps in our understanding. The Herschel Telescope will be launched very soon. At 3.5m in diameter it will be even bigger than the Hubble Telescope. This all-European project from the European Space Agency is being built, in part, to observe the chemical composition of the atmospheres and surfaces of comets, planets and satellites and the molecular chemistry of the universe. It will be orbiting at a distance of around 1.5 million km from Earth.

Meanwhile an earlier space mission from NASA has shown that it's snowing on Mars!

<http://www.guardian.co.uk/science/2009/jan/27/mars-snow-space-technology-nasa>

This is a great summary of the results found by the two NASA "rovers" Spirit and Opportunity which have been driven around the surface of Mars for the last 5 years and are still making new and

exciting discoveries about conditions on our nearest planetary neighbour.

There has been a lot of debate about whether putting humans on Mars is a legitimate goal. The success or otherwise of unmanned missions to date throws that argument wide open. One thing is certain though; we won't stop exploring far beyond the Earth. Whether this exploration is by manned or unmanned spacecraft, you can be sure that chemistry will be at the forefront of the exploration and building our knowledge of the universe.

Whilst satellites can be used to help us look out at our universe we can also use them to look at our own planet. Satellites helped us to see the effects of CFCs on the ozone layer and they continue to provide significant information about the chemistry of our atmosphere.

Learn more about atmospheric chemistry at the *ChemNet* event on 24 March, at the National Space Centre in Leicester. More details on the *ChemNet* events webpage.

free stuff!



Last month's winner of the £20 HMV voucher was Hannah Hopkins from Bloxham in Oxfordshire, well done Hannah! She correctly answered that water was released when the first zeolites were heated.

More freebies are up for grabs this month... there's another £20 HMV gift voucher and a MolyMod kit to be had!

For your chance to win, text us on 07825 186304 with the answer to this question: *When did NASA's first Mars Rover "Spirit" land on Mars?*

You can also send your answer to this email address:

chemnet@rsc.org
The closing date is Saturday 7th March.



“To book a place on a ChemNet event email: chemnet_events@rsc.org or call 01223 432340”

If you want to register to use the discussion board email chemnet@rsc.org

HAVE YOUR SAY!

Would you like to see your article in the next issue? If it's good enough we'll print it! Submit your article to chemnet@rsc.org

CHEMISTRY FACTS

The atmosphere on Mars is very different to Earth's (as you might imagine!) and is made up of 95% carbon dioxide, 2.7% nitrogen and 0.13% oxygen, amongst other gases.

