

Chem¹³ news

Tijdschrift bespreking



Inhoud

- Geschiedenis
- Chem¹³ news
- Kosten
- 'Periodic table project'
- Uitnodiging
- Conclusie



Geschiedenis

- Sinds 1968 biedt Chem¹³ news hulpmiddelen voor docenten
- Voor '13th grade', vandaar de naam Chem¹³ news
- Prof. Reg Friesen van de Universiteit van Waterloo
- Jean Hein is de huidige editor
- 1.200 docenten uit 20 landen zijn lid van Chem¹³ news



What on Earth are Tholins?

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In answer to the title question, tholins aren't on Earth! Well, not naturally on Earth, but they are important elsewhere in the solar system and, most likely, are common in other star systems. Many readers of Chem 13 News will have seen the amazing photos of the surface of Titan, the giant moon of Saturn, with its orange-brown-hazed sky (Fig. 1). Why orange-brown? The colour comes from an atmospheric suspension of a diverse group of carbon-hydrogen-nitrogen compounds called tholins.



Fig. 1. The orange sky seen from the surface of Saturn's moon, Titan. wikipedia.org/wiki/pedia/commons/b/bc/Huygens_surface_color.jpg

Although the wide-spread interest in tholins has only emerged in the last 5 years, the story began over 40 years ago. It was in the 1970s that one astronomer, Carl Sagan, became curious about the high albedo and reddish colour of Saturn's moon Titan. Titan is a huge moon, probably once a dwarf planet captured by Saturn, with an atmosphere twice as thick as Earth's. Titan's atmospheric composition is quite different from that of Earth. Although both are mostly nitrogen (96% and 78% respectively), it is the minor components that are quite different with Titan having methane (1.4%) and hydrogen (0.1-0.2%).

To try to simulate the reactions in Titan's atmosphere, Sagan and his colleagues exposed a mixture of 90% nitrogen and 10% methane to intense radiation! The result of this experiment produced an amazing mixture of organic compounds: alkanes, alkenes, alkynes, aromatic hydrocarbons, aliphatic nitriles, aromatic nitriles and a wide variety of nitrogenous ring compounds. The 'gooey' liquid/solid particulate component had a brown-orange colour. Because of the consistency, Sagan proposed to name this mixture **tholins** from the Greek word, *tholos*, meaning 'mud' and 'vault or dome'. With recent visits by probes to Titan, we now know that the tholin haze is present between altitudes of 60 and 140 km above the surface (see Fig. 2, below). Also, it seems likely that there are extensive tholin deposits beneath the hydrocarbon lakes on the surface.

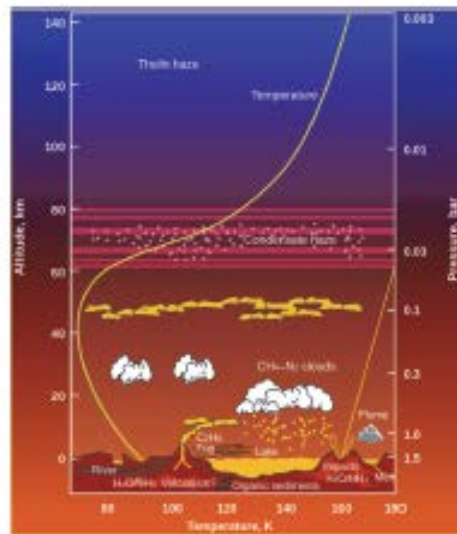


Fig. 2. The detailed structure of Titan's atmosphere and surface, showing the condensate haze layer. wikipedia.org/wiki/Climate_of_Titan#/media/File:Titan_atmosphere_detail_narrow.svg

Valentine's su-chem-du

Audrey Kompter (student)
St. David Catholic Secondary School, Waterloo ON

Using the symbols of the nine elements listed below, complete the su-chem-du to find the answer to the clue! The letters of the elemental symbols in the bolded boxes, when unscrambled, will spell out a Valentine's message.

Oxygen
Neon
Iodine

Potassium
Hydrogen
Beryllium

Aluminum
Sulphur
Calcium



Send in your students' correct solutions to be entered into a draw to win a Poly Density Kit donated by Educational Innovations — see ad on page 19. This prize will be awarded only to the teacher. The deadline is on or before April 2, 2017. Send to Chem 13 News, "Valentine's su-chem-du", Department of Chemistry, University of Waterloo, Waterloo ON N2L 3G1, Canada; Fax: (519) 888-0168; or email: kjackson@uwaterloo.ca.

		K		Be		Al		
Be	O		K		S			H
				H	Ca			
O		I		S				Ca
	H	Ne				O	K	
Ca					O	S		Al
	Ca	Al		K			Be	
K			Al		H			Ne
		H		O		K		

Hint: Candy Hearts

Valentine's Day message

The dashes in the message are for the letters, not symbols.

— — — — —
— — — — — M — — — — — ♥

Periodic Table Project

Ontwerpen van 4 elementaire tegels

► Mobiele app & Muurbehang

- Nihonium (Nh)
- Moscovium (Mc)
- Tennessine (Ts)
- Oganesson (Og)



CLAIM YOUR
PERIODIC FAME

DESIGN THESE
ELEMENTAL TILES

Uitnodiging voor deelname

I would love to have some submissions from the Netherlands.

We had 14 different countries participate in 2011, but none from the Netherlands. Love to have some representation from your country.

Bron:

<https://uwaterloo.ca/chemistry/new-elements-contest>

Chem13 News »

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Kosten

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Conclusie

- Doel:

Docenten stimuleren en inspireren om nieuwe wetenschappelijke leiders van de toekomst op te leiden

- Chem¹³ news bevat aardig hulpmiddelen voor starters

- Gunstig voor elk beginnende docent

- Betaalbaar!!