

## September 2017 chemistry wordoku

						B		N	
N	G								
		A		G	N	S		L	
			N		L				E
	A							R	
G			S		U				
R		N	E	B		A			
							B	S	
B		S							

A
B
E
G
L
N
R
S
U

Solve this wordoku in the same way as a sudoku with letters instead of numbers (each of the nine letters in each row, column and nine-square cell). Once solved, one of the overall diagonals can be rearranged into the name of an organometallic chemist

## September 2017 word grid

Er	O	O
Ca	U	Ni
S	Rb	F

**Prize entry:** Using each element symbol in the grid only once, combine them together to make a single word of 13 letters.

Word.....

**Just for fun:** Construct as many other words as you can using a minimum of three symbols, and each symbol only once.

6 words: OK  
9 words: Good  
12+ words: Excellent

## Entry form

There are four prize puzzles on this page: crossword (cryptic answers only); wordoku; molecule search; and word grid. For each puzzle, a winner will be selected from all the correct entries received and awarded a £25 book voucher.

You can enter any or all of the prize draws, but each entrant is only eligible to win one of the individual puzzle prizes each month.

Please enter your details below and either post or email this page with your completed entries to us by **20 September 2017**. The winners of this month's puzzles will be published in the September 2017 issue, along with the solutions.

Chemistry World puzzles, Royal Society of Chemistry,  
Thomas Graham House, Science Park, Milton Road,  
Cambridge, CB4 0WF, UK  
Email: chemistryworld@rsc.org

Name .....

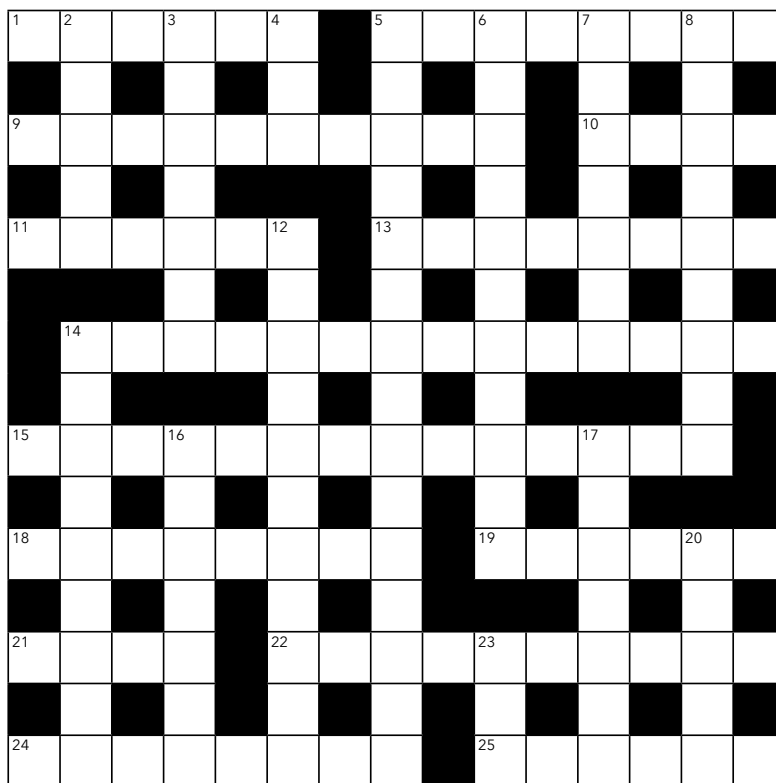
Email .....

Tel .....

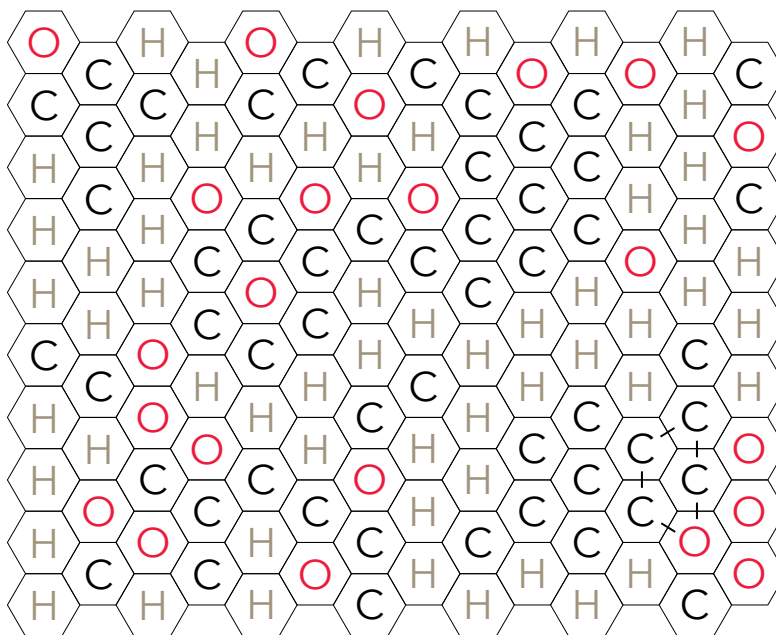
Participants are advised that any personal information supplied will be processed in connection with this competition and only in accordance with our privacy statement ([www.chemistryworld.com/privacy](http://www.chemistryworld.com/privacy)).

RSSL may wish to contact you via email with further information about products and services. Please tick the box if you would like to be contacted by RSSL via email and consent to us sharing your contact details with RSSL for this purpose

## September 2017 crossword



## September 2017 molecule search



Connect atoms in adjacent cells using single or multiple bonds to reveal the hidden molecules. The hexagonal grid necessitates some minor distortion of bond angles - for example the five membered ring drawn in as a starting point.

Find these three molecules. We've already started one of them for you.



Clues: One of the molecules is aromatic, one is aliphatic and one is heterocyclic but not aromatic. Two of the molecules contain at least two hydroxyl groups, one contains carboxylic acid groups.

**Cryptic (prize entry)**
**Across**

- Shop around outskirts of Aldershot for fertiliser (6)
- Odd grunge youth turns hard (5, 3)
- Movie trend about composer (10)
- Old party wishing sin away (4)
- Vessel known for small storms (3, 3)
- Recluses see remit change (8)
- Googled history about water-diviner? (14)
- Pascal shy about noisy therapy (14)
- Pam and Val make aluminium light (4, 4)
- Is cross about her rupture (6)
- Fish oddly prickled (4)
- I'm nice about each apparatus (though cool!) (3, 7)
- Queen plays chess oddly for succession (8)
- Much nickel around German city (6)

**Quick (just for fun)**
**Across**

- European peninsula (6)
- Go up (8)
- Swiss sculptor and painter (10)
- Soft clay mineral (4)
- Condition of having  $\text{CO}(\text{NH}_2)_2$  in the blood (6)
- Cracker (8)
- English scientist renowned for his studies on electromagnetism (7, 7)
- Italian scientist of constant fame (6, 8)
- Geological period (8)
- Cram (6)
- Spanish river (4)
- Devices for fragrancing the home (3, 7)
- Rudolf, for example (8)
- Charged particles (6)

**Down**

- Love the area-it's a gas! (5)
- Diana prepares extremely toxic neutraliser (7)
- Top victory in halting return of infection (3)
- Repent hype about nice eastern coin (10, 5)
- Cruella upsets the French Uni about a singular issue! (11)
- See 17 Down (7)
- Seen virus mutating in cosmic places (9)
- Early union adding positivity (11)
- Hate Minis turning into compound (9)
- Leading conservationists hate gold building (7)
- 7 Down Cosmologist thinks when page is turned (7, 7)
- Ironically rally left with charge (5)
- Regular valium provides focus (3)

**Down**

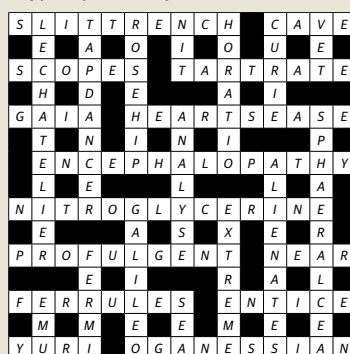
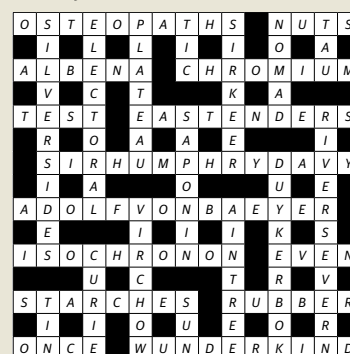
- Thorny plant (5)
- Composed of D and L forms in equal proportion (7)
- Limb (3)
- Between collar bones (15)
- Sylvester Stallone film of 1993 (11)
- Baltic country (7)
- Visual effect of the sun due to atmospheric conditions (5, 4)
- Green feldspar named after South American river (6, 5)
- Unforgettable (9)
- Cavalryman (7)
- Italian Renaissance polymath (2, 5)
- Nerve agent ( $\text{C}_4\text{H}_{10}\text{FO}_2\text{P}$ ) (5)
- Federal republic (3)

**Industry Leading Pharmaceutical Training**

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  - Cleaning Validation
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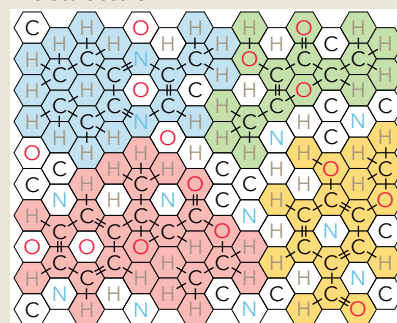
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**August 2017 solutions and winners**
**Cryptic (prize entry)**

**Quick (just for fun)**

**Wordoku**

The name of the scientist was Konstantin NOVOSELOV

**Word grid**

The nine-symbol word was ICHTHYOSAURUS

**Molecule search**

**August winners**
**Molecule search**

E Ditzel, Howden, UK

**Wordoku**

T Hamor, Sheffield, UK

**Word grid**

H Fowler, Orpington, UK

**Crossword**

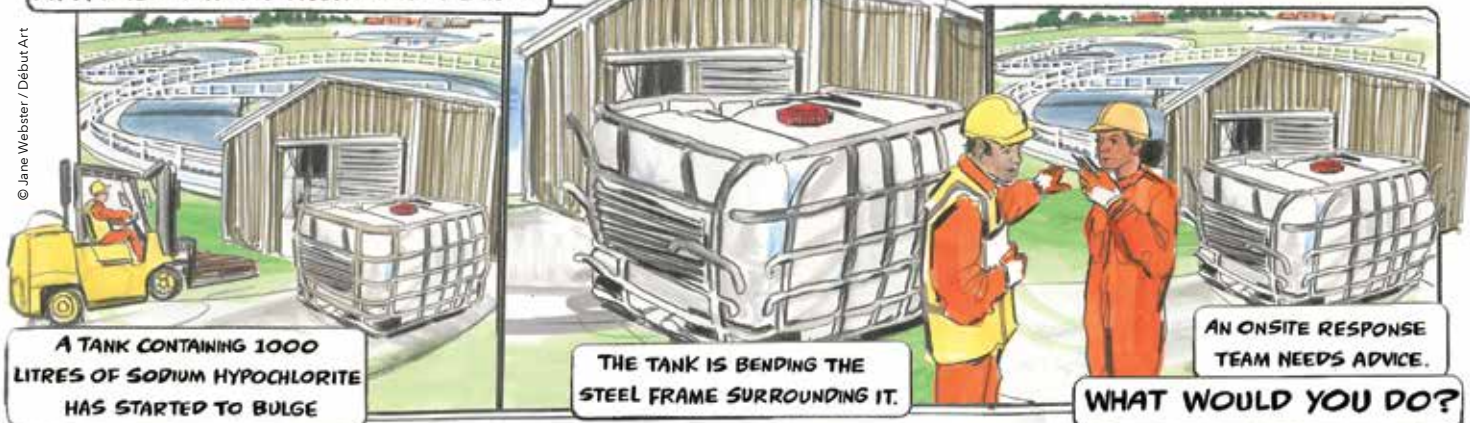
R Dennis, Sawbridgeworth, UK

The four molecules, which play a tasty part in popular ice cream flavours, are hazelnut pyrazine, vanillin, furaneol and strawberry aldehyde.

**Answer to On the spot**  
The sodium hypochlorite has begun to decompose and is reacting to give off chlorine gas, which is corrosive and toxic. There are two options. First, you could apply water to the tank to slow the rate of reaction and lower the internal pressure, which would reduce the immediate risk to personnel, although there is a strong possibility that the tank could fail. Alternatively, a team could relieve the pressure on the tank and allow the gas to escape, either by opening the top cap or puncturing the vessel from a distance. Even if the second option is used, the gas would be expelled under pressure, so it is advisable to set up a dam and apply water to the vessel, reducing the pressure and dissolving some of the gas, and reducing the risk of inhalation. In either case, the reaction can be monitored using thermal imaging cameras.  
Tom Johnson is an emergency responder at the National Chemical Emergency Centre

**On the spot: A call from a site manager**
**AT A WASTEWATER TREATMENT PLANT..**

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A TANK CONTAINING 1000 LITRES OF SODIUM HYPOCHLORITE HAS STARTED TO BULGE

THE TANK IS BENDING THE STEEL FRAME SURROUNDING IT.

AN ONSITE RESPONSE TEAM NEEDS ADVICE.

WHAT WOULD YOU DO?