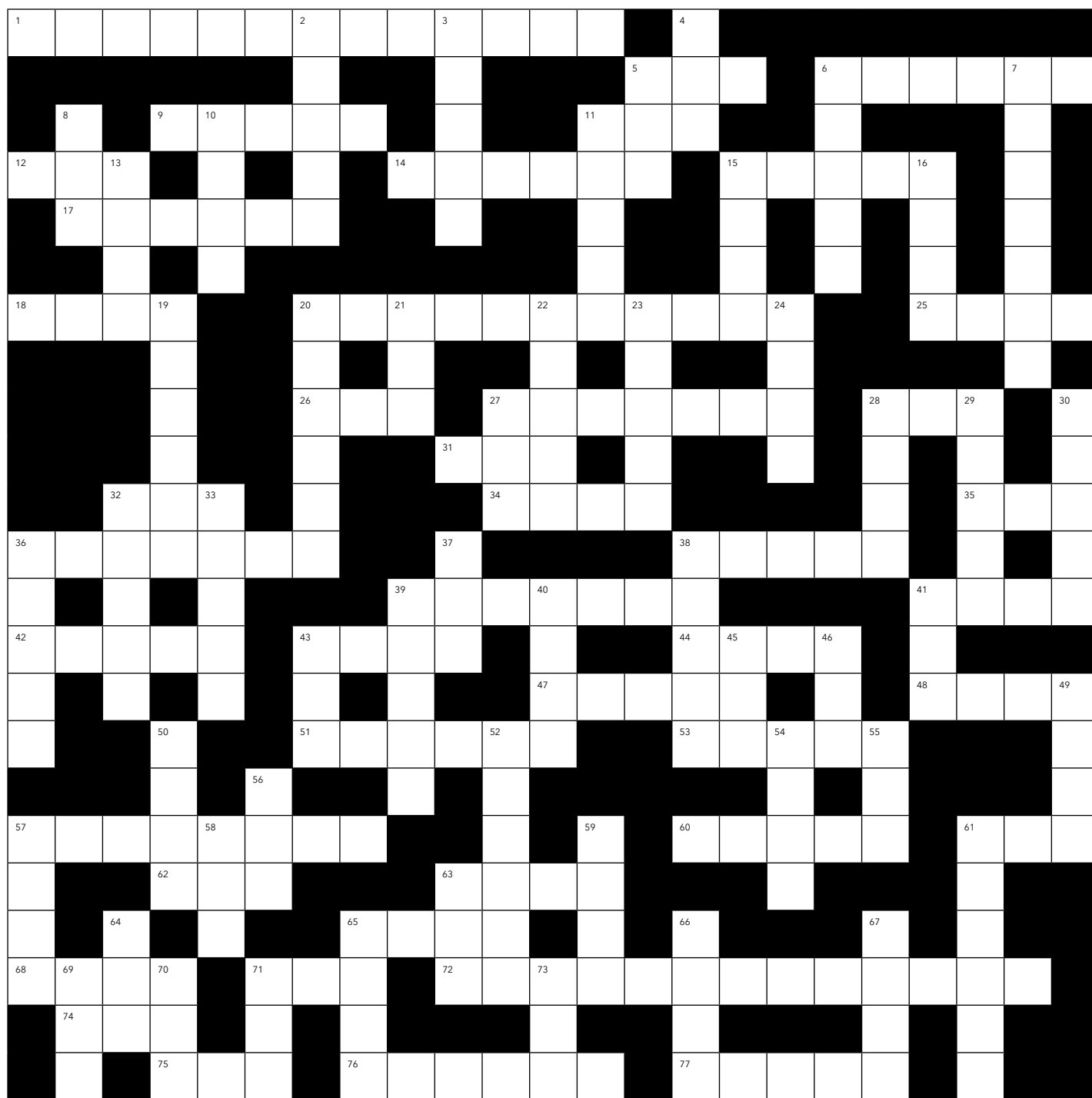


December 2025 Jumbo CrOsSWORD



Our puzzles are sponsored by Shimadzu.

Shimadzu, a global leader in Precision Analytical Instrumentation

Celebrates its 150th anniversary, marking a legacy of scientific innovation. Guided by *Kaizen and Excellence in Science*, we drive advancements in research and development across variety of industries.

Our cutting-edge solutions support diverse applications, including LC, LCMS, GC, GCMS, TOC, ICP, AA, EDX, UV-VIS, FTIR, Fluorescence, MALDI-MS, Material Testing, Particle Analysis, Hardness Testing, High-Speed Imaging, and Balances.

shimadzu.com/150th_anniversary/dna/



Entry form

This month there are only two prize puzzles: the cryptic elements crossword and the quick regular crossword. For each crossword, a winner will be selected from all the correct entries received. Each winner will receive a hamper just in time for Christmas.

You can enter both of the prize draws, but each entrant is only eligible to win one puzzle prize.

Please enter your details and email a scan or photograph of this page with your completed entries to us by **15 December 2025**. The winners of this month's puzzles will be published in the January 2026 issue, along with the solutions.

Email: chemistryworld@rsc.org

Name

Address

.....

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).

Prize entry 1: Cryptic elements crossword

Each crossword square can have one or two letters, which must be letters of an elemental symbol, or the letters D or T (for deuterium and tritium). For example, Dalton could be written D(Al)TON. For the first time, all 118 elements have been used.

Across

- 1 Unfinished lab arranges construction of main separators (13, 7)
- 5 I assembled kit right for the island (5)
- 6 Outwardly unusual shrub exchanged for another plant (7)
- 9 Has flung refurbished camera equipment (8)
- 11 In a minor group (5)
- 12 Sock, belt or part of a shirt? (4)
- 14 **8 Down** Yobs becoming troublemakers (4, 4)
- 15 Incorporate good French road development (7)
- 17 Tastes parts of a bird (7)
- 18 Hurry after Charlie? Just an infatuation! (5)
- 20 Acrobat climb upset crank scientist (7, 10)
- 25 Second white wine? What a surprise! (5)
- 26 Stories from South American state (5)
- 27 Much writing about pink animal (8)
- 28 This blabbermouth could get you high (6)
- 31 Place in handbag or accessory (5)
- 32 Drink for an American dad? (3)
- 34 Campers' aims for accommodation? (7)
- 35 Inert mix? Far from it, it's an ingredient of gunpowder! (5)
- 36 Angles after car, crashing sometime after (10)
- 38 Not all can absorb it all going round (7)
- 39 Sick photos disturbed the bridge game (10)
- 41 Most recent experiment following the French (6)
- 42 Problem after United Nations disengage (7)
- 43 Thumbs around India for metal (7)
- 44 A place for copper working? (5)
- 47 Drawn back to nothing but going ahead anyway (6)
- 48 Dusty sort of den (5)
- 51 I recycle diodes for the salts (7)
- 53 Heading off, misses no organised meeting (7)
- 57 Tom confessed-about time! (12)
- 60 A zinc lute playing something from the Stones? (9)
- 61 Places in **2 Down** (4)
- 62 Sister's other baby's starting to cry (3)
- 63 Top tip about **63 Down** country (6)
- 65, **67 Down** Cook plum pastries and you can put them to the test (6, 6)
- 68 Sprite changed for French spirit (6)
- 71 Accuracy hurt third-rate engineer (5)
- 72 Surprisingly good Anchorage pilot in a magazine (8, 10)
- 74 I nose around the chemical company (5)
- 75 At the beginning, how chemists formulated certain special gases (5)
- 76 Furniture made from vessel timbers (9)
- 77 Fancy I left corgis by the androids (7)

Down

- 2 Sputnik cut short-corrupted data (6)
- 3 Cultivated cactus rose sparkles (10)
- 4 Hot iron transformed into animal (5)
- 5 Knife is under a kilo - right? (4)
- 6 Romeo leaves terribly bad rooms to the animal (7)
- 7 Possibly shy, concede the trope (10)
- 8 Inside drafty boat (4)
- 10 Papa's picnic includes jelly (5)
- 11 Mad lying around plant compound (9)
- 13 Mends six iron needing repair (5)
- 15 King who's rich within (5)
- 16 After a fashion, cedes uniform ties (6)
- 19 Fool a human oddly about something in the night sky (8)
- 20 President gets rid of blazers (9)
- 21 Need to leave baked beans to make something else to eat (6)
- 22 Chat later about molecular trap (9)
- 23 At sea, taps most spars (8)
- 24 Twists and turns in black ink scrawls (5)
- 27 Colin left out the money (4)
- 28 Beast left, right out of Viagra funnily (6)
- 29 Flagon is thoroughly containing the active substance (7)
- 30 Left chest for Robin (9)
- 32 Said to take Santa's outdoor fare (7)
- 33 Ambitious to promote unknown (5)
- 36 Alarm guard sees little shields (9)
- 37 Both right about the soup (5)
- 38 Prizes some of Volvo's car seats? (6)
- 39 Hammers the weights (6)
- 40 Treated pet so it treads carefully (7)
- 41 First late again, when she rules (4)
- 43 Something a little bit fishy in showbiz rituals (5)
- 45 Does assorted poems (4)
- 46 Utterly perfect, delightfully outrageous, original hairstyle (4)
- 49 Mondays could turn electric (7)
- 50 Provisions for seasonal visitors? (7)
- 52 Loathing's debated on the radio (7)
- 54 Daft girl sounds out compound (8)
- 55 Public school returns the memo (4)
- 56 Physics Nobels include an upstart (4)
- 57 States settle, doctors last off (7)
- 58 Shelled acorns could be sweet (4)
- 59 Prepare T-bone for a Tokyo lunch (5)
- 61 Smashed up, delivers order (10)
- 63 Turn a hard bun into dinner (5)
- 64 Oscar leaves **4 Down** to head east to the river (5)
- 65 Stoney part of Bali thickens (6)
- 66 With heavy metal I call extremely hot perhaps (7)
- 67 See 65 Across**
- 69 Not sure? Surprise Mike with the optical device? (5)
- 70 Shot abroad? Nonsense! (4)
- 71 Heard to approve of repetitions (4)
- 73 European flower is a revelation at the start (4)

Prize entry 2: Quick crossword

This one is a regular crossword; no element symbols are needed.

Across

- 1 Founder of our sponsor (5, 8)
- 5 Element (3)
- 6 Subatomic particles (6)
- 9 Fluid in which phosphorus was discovered (5)
- 11 Large expanse of water (3)
- 12, **57 Across** Russian after whom a mineral (CaTiO₃) is named (3, 8)
- 14 Electrical engineer, employed by our sponsor, who shared the 2002 Nobel prize in chemistry (6)
- 15 **See 8 Down** (5)
- 17 Sedimentary rock comprised of small, egg-like grains of calcium carbonate (6)
- 18 Bishop given Nobel peace prize (4)
- 20 String-like structures containing genetic information (11)
- 25 Part of the body, or a bottle (4)
- 26 Shape of bacilli bacteria (3)
- 27 **See 28 Across** (7)
- 28, **30 Down**, **27 Across** British biologist awarded Nobel prize for discovery of acquired immunological intolerance (3, 5, 7)
- 31 Insect (3)
- 32, **36 Across**, **34 Across** Cornish inventor who discovered several elements (3, 7, 4)
- 34 **See 32 Across** (4)
- 35 Mineraloid gemstone (3)
- 36 **See 32 Across** (7)
- 38 **See 43 Across** (5)
- 39 Composer and contemporary of Mozart (7)
- 41 Medium used to grow cultures (4)
- 42 Plant tissue (5)
- 43, **38 Across** Qualitative measure of hardness (4, 5)
- 44 Turn over (4)
- 47 City where our sponsor began (5)
- 48 Smallest structural and functional unit of an organism (4)
- 51 Proposals (6)
- 53 Gram _____, used for classifying bacteria (5)
- 57 **See 12 Across** (3)
- 60 **See 36 Down** (5)
- 61 Doctorate (abbrev) (3)
- 62 Garland (3)
- 63 The T in QTOF mass spectrometer; an instrument provided by our sponsor (4)
- 65 Elemental example of **37 Down** (4)
- 68 Seep (4)
- 71 Constricting snake (3)
- 72 US geneticist who discovered sex chromosomes (6, 7)
- 74 Couple (3)
- 75, **76 Across**, **77 Across** Composer and chemist (3, 6, 5)
- 76 **See 75 Across** (6)
- 77 **See 75 Across** (5)

Down

- 2 Joint (5)
- 3 Analyse (5)
- 4 By way of (3)
- 5 Source of theobromine (3)
- 6 Alloy of copper and zinc (5)
- 7 Co-discoverer of rhenium (7)
- 8, **15 Across** Japanese co-recipient of physics Nobel prize for work on tunneling in semiconductors (3, 5)
- 10 Precipitation (4)
- 11 Biases (5)
- 13 SI Unit (4)
- 15 Periphery (4)
- 16 Element (4)
- 19 To remove an oar or mast from its original position (6)
- 20 Large bottle used for storing corrosive substances (6)
- 21, **39 Down** Phenomenon producing an increase in the wavelength of electromagnetic radiation (3, 5)
- 22 _____ fatty acids (5)
- 23 Reproductive organ (5)
- 24 Take up (4)
- 27 Mix of silt and clay size material (3)
- 28 Trigonometric function (4)
- 29 Rearrange (5)
- 30 **See 28 Across** (5)
- 32 Odour (5)
- 33 Parallelogram, four equal sides (5)
- 36, **60 Across** -C₆H₁₃ (5, 5)
- 37 The G of GCMS-MS; an instrument provided by our sponsor (3)
- 38 Sieves (5)
- 39 **See 21 Down** (5)
- 40 Printing supplies (4)
- 41 Part of a circle (3)
- 43 Unit of electrical conductance (3)
- 45 Item for auction (3)
- 46 Greek letter for golden ratio (3)
- 49 Element (4)
- 50 Lower the temperature (4)
- 52 Purify (6)
- 54 Smallest part of an element (4)
- 55 Snooze (3)
- 56 ψ (3)
- 57 Tablet (4)
- 58 Check (3)
- 59 Turn from solid to liquid (4)
- 61 C₆H₅OH (6)
- 63 Mass (3)
- 64 Greek letter (3)
- 65 Part of **25 Across** (4)
- 66 Part of **20 Across** (4)
- 67 Finished (4)
- 69 Former name of Tokyo (3)
- 70 Greek island (3)
- 71 Unit of pressure (3)
- 73 Viscous black liquid (3)

Editor's choice Flow reactor system for solid phase peptide synthesis

Traditional batch peptide synthesis works, but suffers from unpredictable kinetics, challenging scale-up, inefficient reagent use, and little real-time insight. Vapourtec's fast flow solid phase peptide synthesis (FF-SPPS) system overcomes these limits with a packed-bed reactor, uniform heating, and in-line monitoring.

In batch, stirred resin and back-mixing create a normal distribution of deletions. In FF-SPPS the resin is packed in Vapourtec's Variable Bed Flow Reactor (VBFR), which auto-adjusts bed height during coupling and deprotection. The static bed prevents bead movement, minimises reactor volume, sweeps away by-products, and maintains constrained reagent fronts – favouring the target sequence even at sub-stoichiometric loading.

Controlled heating suppresses β -sheet aggregation and accelerates hindered



couplings (eg *N*-methyl residues). Amino acids can be pre-heated and pre-activated before entering the VBFR, shortening cycles.

Uniform temperature improves reproducibility and avoids racemisation or linker loss (eg chlorotriyl).

The PS-30 pilot platform mirrors lab-scale mixing and heating, allowing methods optimised at 50 μ mol to scale directly to 30mmol.

VBFR bed-volume tracking flags aggregation, while in-line Fmoc-deprotection quantitation gives immediate progress readouts.

Effective couplings with ~1.2 equivalents of amino acid reduce costs, especially for expensive residues, and solvent use is typically ~80ml/mmol per cycle.

www.vapourtec.com
Tel: +44 (0) 1284 728659
info@vapourtec.com

Where will your career take you?

Find your path with free resources and advice from our expert team

rsc.li/career-management



November 2025 solutions and winners

Cryptic

C	A	R	S	O	N	E	S	S	E	N	C	E	S
A	E	Y	F	I	K	A	T						
R	E	G	I	S	T	R	A	R	A	S	S	A	Y
B	A	T	E	H	B	S	S	E					
A	N	I	S	E	E	D	U	T	O	P	I	A	
T	N	R	E	M	R	N	C						
T	E	S	T	K	R	Y	P	T	O	N	I	T	E
E			O	I	H	N							
R	O	B	E	R	T	C	U	R	L	C	E	L	L
Y	O	P	K	Y	A	L	U						
C	H	A	I	R	S	D	A	N	I	E	L	L	
G	R	M	O	A	O	M	I						
O	X	I	D	E	D	I	V	E	R	G	E	N	T
L	U	N	D	Y	A	N	I						
D	I	M	E	T	H	Y	L	S	K	A	T	E	S

Quick

M	I	N	I	U	M	S	C	A	N	D	I	U	M
I	O	N	D	L	E	N	A						
C	O	R	T	I	S	O	N	E	W	A	T	T	S
R	R	S	R	M	D	E	S						
O	R	I	N	O	C	O	E	N	E	R	G	Y	
S	S	N	T	N	L	E	A						
C	O	H	N	P	H	O	S	P	H	O	R	U	S
O			A	Y	W	I	B						
P	E	N	I	C	I	L	L	I	N	B	A	S	E
E	I	T	S	N	N	C	S						
M	O	L	I	N	A	K	E	E	N	E	S	T	
L	B	N	Y	L	W	T	O						
A	L	I	B	I	E	L	E	C	T	R	O	N	S
M	T	D	R	R	O	N	I						
P	R	E	T	E	N	S	E	K	N	E	E	L	S

Wordoku

The German chemist specialising in nanotechnology and photocatalysis was (Detlef) BAHNEMANN.

Coronene puzzle

- A. Arch, Cacti, Luck
- B. Ion, Moody, Yoga
- C. Agrees, Cereal, Ogres
- D. Flyer, Hymn, Pyre

The American organic chemist and Nobel prize winner for his 'retrosynthetic analysis' was (Elias James) Corey.

Crosswords compiled by Paul Board, whose puzzle book *Elementary!* is available to order online at: rsc.li/ElementaryBook

November winners

Coronene
 Tanja Van Mourik
 Leven, UK

Wordoku
 Graeme McArdle-Capon
 Durham, UK

Cryptic crossword
 Ian Burns
 Huntingdon, UK

Quick crossword
 Helen Smalley
 Woodley, UK