

## Featured product Effective extraction and solvent recycling with air condensers

Sustainable cosmetics firm Keracol is using Asynt's DrySyn heating blocks and CondenSyn air condensers in the development and scale-up of its Mandarin green beauty product range. Kristina



identifying the optimal conditions for extraction of specific active compounds. The DrySyn heating blocks and hotplate stirrers have proven to be highly reliable in reproducing the conditions for our extraction protocols. We rely on the CondenSyn

Hetherington, senior scientist at Keracol, said 'Finding ways to reduce water consumption and conserve energy is essential to us. Working with different food waste requires researching and

waterless condensers to recycle our solvents. The CondenSyn Maxi has ensured we recover 98% of the solvent, which we recycle for subsequent extractions.'

[www.asynt.com/](http://www.asynt.com/)

## Featured product Scalable continuous flow photochemical reactor

The PhotoSyn high power LED photoreactor, from Uniqsis, eliminates problems associated with traditional batch methods enabling synthetic chemists to routinely scale up photochemistry reactions from milligrams to several kilograms per day. Using a pair of enclosed curved cooled LED arrays, the PhotoSyn efficiently focuses light inwards onto a central coil reactor. Each array is composed



of 360 individual LEDs that provide a high photon intensity to facilitate reactions in coil reactors (up to 52ml) and enabling easy reaction scale-up.

To maximise safety, PhotoSyn operates without any light leakage, and therefore does not require a tinted or light-tight enclosure.

[www.uniqsis.com/paProductsDetail.aspx?ID=PhotoSyn](http://www.uniqsis.com/paProductsDetail.aspx?ID=PhotoSyn)



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## November 2022 solutions and winners

### Cryptic

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

### Quick

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | A | P | E | T | O | W | N | S | T | A | C | K | S |
| A | A | A | A | I | T | H | Y | C |   |   |   |   |   |
| R | E | L | I | C | L | E | O | E | S | A | K | I |   |
| L | M | H | L | B | T | N | E |   |   |   |   |   |   |
|   | O | Z | O | N | I | F | I | C | A | T | I | O | N |
| S | I |   | A | A |   | D | C |   |   |   |   |   |   |
| W | I | L | H | E | L | M | S | C | H | E | E | L | E |
| A |   |   | O | C | S | E |   |   |   |   |   |   |   |
| M | E | I | T | N | E | R | M | A | N | D | E | L | A |
| M | N |   | O |   | O |   | N | B |   |   |   |   |   |
| E | L | E | C | T | R | O | P | L | A | T | E | D |   |
| R | R | H | K | L | O | O | L |   |   |   |   |   |   |
| D | E | T | E | R | E | Y | E | T | A | R | S | I |   |
| A | I | U | S | T | A | S | S |   |   |   |   |   |   |
| M | I | A | S | M | A | S | T | I | L | B | E | N | E |

### Wordoku

The artificial sweetener was SACCHARIN

### Science scramble

1 Celt; 2 Elect; 3 Select; 4 Lecterns; 5 Electrons; 6 Tolerances; 7 Ernest O Lawrence.

|    |   |    |    |    |
|----|---|----|----|----|
| Ca | F | Fe | I  | Ne |
| La |   | Ti |    | O  |
| B  | I | S  | O  | N  |
| As |   | He |    | At |
| H  | U | S  | Ti | Es |

### November winners

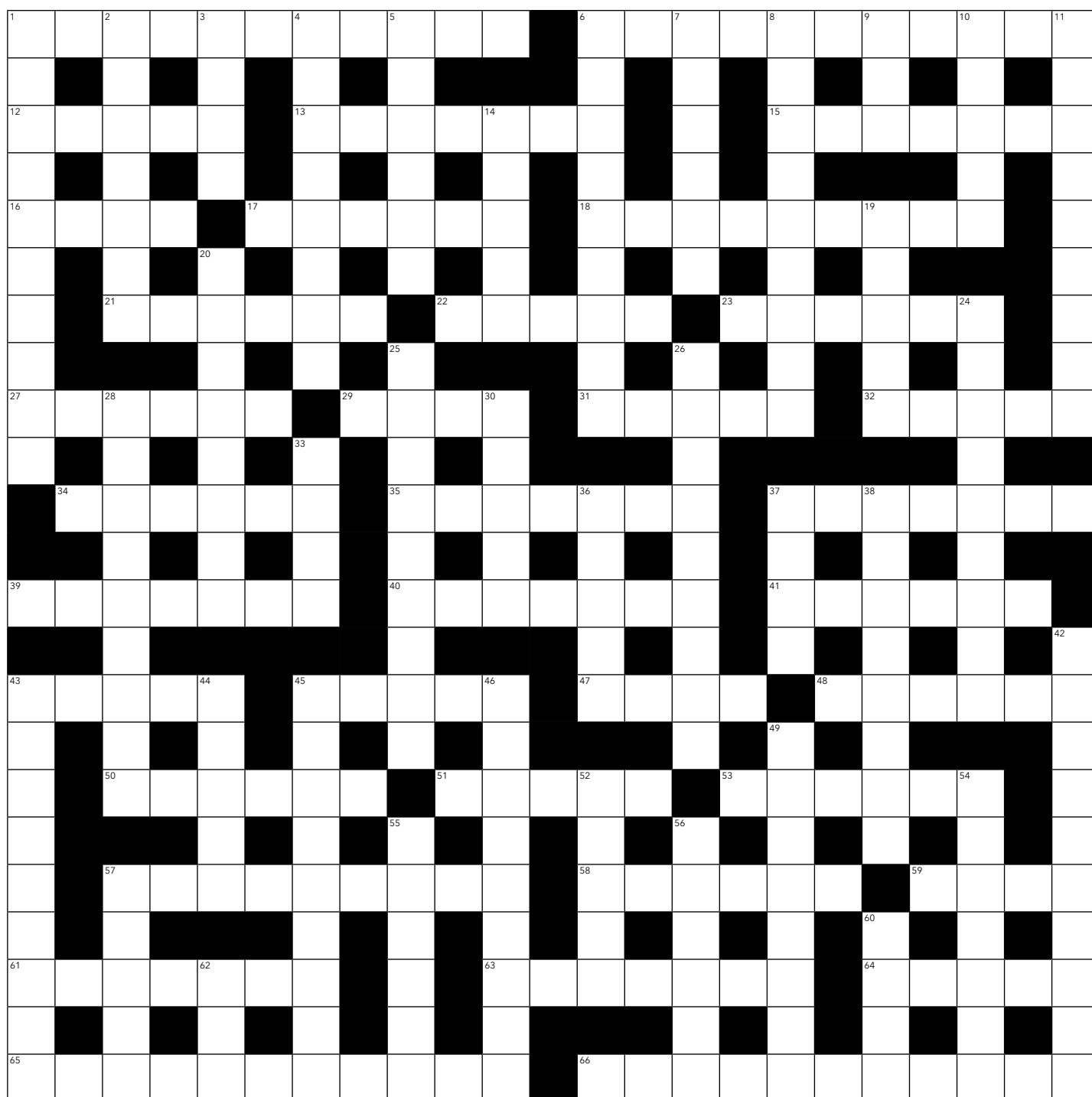
Science scramble  
Teresa Sinclair  
Baldersdale, UK

Wordoku  
Peter Watt  
Leigh, UK

Cryptic crossword  
Laurence Reed  
Hull, UK

Quick crossword  
Ian Laming  
Chippenham, UK

## December 2022 Jumbo CrOsSWORD



### 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 **14 December 2022**. The winners of this month's puzzles will be published in the January 2023 issue, along with the solutions.

Email: [chemistryworld@rsc.org](mailto: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](http://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 or tritium). For example, Dalton could be written D(Al)TON.

- | Across   | Down  |
|--|---|
| 1 Carol cartwheels around a polymer chemist (7, 9)                       | 1 Physicist who's uncertain where greener bins get recycled? (6, 10)        |
| 6 Psychedelic healing arranged by council? (14)                          | 2 She heartlessly prepared ravioli for the French chemist (9)               |
| 12 Second reaction turns biotin into a mineral (7)                       | 3 Refers to the tourist attractions on the radio (5)                        |
| 13 Small piece of lab glass hides the edge? (9)                          | 4 So council sorted the blockage (9)  |
| 15 Anyhow I left points on constantly (7)                                | 5 Gathers around her vast sierra (8)  |
| 16 Motors you can get carried away with! (7)                             | 6 Old physician happier about cost (11)                                     |
| 17 Can be pressure if Cosmo sorts it (7)                                 | 7 Matches revised first clue without trouble initially (8)                  |
| 18 Needing treatment, operations save the very amorous (14)              | 8 Charging oddly iconic nations abroad (10)                                 |
| 21 Letters about noise or wearing away (7)                               | 9 Cross one form of cattle (4)  |
| 22 Reportedly conceal fee for compound? (7)                              | 10 Salt sounding like salary for someone working the late shift (7)         |
| 23 Clergy involved in rubbish operation (6)                              | 11 See 35 Across  |
| 27 Chemist ran around being extremely furtive (3, 7)                     | 14 Sick about gutless Tory getting difficult (6)                            |
| 29 I ordered card for the physicist (5)                                  | 19 Some got her showing them (6)  |
| 31 Heir shall come into our neighbourhood to start with (5)              | 20 Mutated infestation speeding up (11)                                     |
| 32 Somehow scare us with fictional flying objects? (7)                   | 24 Unusually septic pirate drops out (12)                                   |
| 34 Oddly ignored fools avoid becoming this shape? (7)                    | 25 Princess doubting characteristic (10)                                    |
| 35, 11 Down Astronomer laconic about precious sun (8, 10)                | 26 Separates stoics and aides on order (11)                                 |
| 37 Developed a test photo of the dentifrice? (10)                        | 28 Engineers find extremely outrageous oval compounds (10)                  |
| 39 Rearrange corn genes' constituents (9)                                | 30 Cynic exchanges at first nerdy for extremely cool on a regular basis (6) |
| 40 Philosophical about acrostic? (8)                                     | 33 Principal lass hiding a heavenly body (6)                                |
| 41 No will for native test abroad without Victor? (9)                    | 36 Doctor locates the sugar (7)   |
| 43 Moans about the malbec and merlot so they say (6)                     | 37 Coach (but not a coach) (5)  |
| 45 Relocated Israeli composer (7)  | 38 Proud and healthier tailor (9)   |
| 47 Drugs - some used at establishment's party? (7)                       | 42 Chemist sore about nonsense rhymes to begin with (5, 8)                  |
| 48 Artist helping to make isotopic assortment (7)                        | 43 A cow's drover upset the artisans (11)                                   |
| 50 Lops any pines found around the copse (7)                             | 44 Ask if fare includes the boat (5)  |
| 51 I modified snake's enzymes (7)  | 45 Iris and cygnets surprisingly symbiotic (11)                             |
| 53 Flautist endlessly playing this passage (7)                           | 46 Chap treated idiot with first illness of unknown cause (10)              |
| 57 Highway patroller upsets prof in extremely chic Fiat (7, 3)           | 49 Discard crazy spoof ideas without initial approval (7, 2)                |
| 58 Soldier charts these passages (10)                                    | 52 Leader pours me a cocktail (7)   |
| 59 Such oration needs shortening for Nelson (7)                          | 54 Physicist sails around Aruba (5, 5)                                      |
| 61 Cut up about civvies' top tip being confused (8)                      | 55 Note reprimand (4, 3)  |
| 63 Make uniform out of something regularly holed but not first time (10) | 56 Arranged grand original art for the painter (9)                          |
| 64 Perhaps nobs love this particular kind of thing (5)                   | 57 Island providing you French with endless value (6)                       |
| 65 If such a topic can make one musical? (5, 7)                          | 60 Cherubic girl leaving the crystal structure (5)                          |
| 66 Without Papa, I'd turn pacification into proton donation (13)         | 62 These think I'm hiding a son of Adam (4)                                 |

## Prize entry 2: Quick crossword

This one is your regular type of crossword, no element symbols are needed.

- | Across  | Down   |
|---|--|
| 1 Co-discoverer of nuclear fission (4, 7)   | 1 Italian scientist, the world's first female professor of physics (5, 5)                                |
| 6, 34 Across Fungus that is the source of 28 Down and also lends its name to it (11, 6)               | 2, 66 Across Obsolete name for ammonia (7, 2, 9)   |
| 12 Body fluid from which phosphorus was first isolated (5)  | 3 Timid (4)  |
| 13 Brand of bottled mineral water named after the doctor who bought the spring in southern France (7) | 4 London college where Nobel laureate Geoffrey Wilkinson studied (8)                                     |
| 15 See 18 Across  | 5 See 40 Across  |
| 16 See 7 Down   | 6 See 27 Across  |
| 17 Methylphenol (6)   | 7, 16 Across Explosive and medicine that gets its name from the Greek for bitter due to its taste (6, 4) |
| 18, 15 Across British chemist who invented the concept of catalysis (9, 7)                            | 8 Bent the light (9)   |
| 21 Steam baths (6)  | 9 Unwell (3)   |
| 22 Colour for microscopic study (5)   | 10 Percolate (5)   |
| 23 Layers of rock (6)   | 11, 37 Across The _____, book by Irish chemist Robert Boyle (9, 7)                                       |
| 27, 6 Down Swedish physical chemist who proposed the theory of ionic dissociation (6, 9)              | 14 Estuary (5)   |
| 29 Softest mineral on the Mohs scale of hardness (4)  | 19 Japanese physicist and discoverer of the tunnel diode (5)   |
| 31 State of matter (5)  | 20 Plant produced by selective breeding (8)  |
| 32, 41 Across $PV = nRT$ (5, 3, 3)  | 24 Type of coffee (9)  |
| 34 See 6 Across   | 25 British engineer after whom the SI unit of power is named (5, 4)                                      |
| 35 Fibre produced from a type of grass (7)  | 26 Each of two or more physical forms of an element (such as graphite, diamond and charcoal) (9)         |
| 37 See 11 Down  | 28 Carcinogen formed by certain fungi found on agricultural crops (9)                                    |
| 39 Distillation devices (7)   | 30 Porous container used for assaying precious metals (5)  |
| 40, 5 Down Discoverer of the third law of thermodynamics (7, 6)                                       | 33 Snakes (4)  |
| 41 See 32 Across  | 36 Therapy (5)   |
| 43 Blends (5)   | 37 Faraday _____, enclosure used to block electromagnetic fields (4)                                     |
| 45 Reptile (informal) (5)   | 38 Californian national park (8)   |
| 47 Bread rolls (4)  | 42 Analgesic introduced in 1887 by Bayer but withdrawn in the 20th century (10)                          |
| 48 Type of non-striated involuntary muscle (6)  | 43 Element isolated by Swedish chemist Johan Gottlieb Gahn in 1774 (9)                                   |
| 50 Almost (6)   | 44 Bog (5)   |
| 51 Personnel (5)  | 45 First world war battle where physicist Henry Moseley met his end (9)                                  |
| 53 Infected (6)   | 46 Rare transition metal (9)   |
| 57 Size (eg of a wave) (9)  | 49 British engineer who developed a process for making steel (8)   |
| 58 Look forward to (6)  | 52 Italian physicist after whom an element and subatomic particle are named (5)                          |
| 59 Element used in galvanisation (4)  | 54 US city where the first atomic pile was tested by a team led by 52 Down (7)                           |
| 61 Greek architect and artist (2, 5)  | 55 Centres of atoms or cells (6)   |
| 63 Element named after the Greek for rainbow (7)  | 56 Santa's transport (6)   |
| 64 Interact chemically (5)  | 57 Noble gas (5)   |
| 65 Actinide element named after a physicist (11)  | 60 Geological divisions of time (4)  |
| 66 See 2 Down   | 62 Consume (3)   |

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

Last month's puzzle solutions and winners can be found on p57.