

Element crossword challenge

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We would like to invite you to participate in the *Analytical Challenge*, a series of puzzles to entertain and challenge our readers. This special feature of “*Analytical and Bioanalytical Chemistry*” has established itself as a truly unique quiz series, with a new scientific puzzle published every three months. Readers can access the complete collection of published problems with their solutions on the ABC homepage at <http://www.springer.com/abc>. Test your knowledge and tease your wits in diverse areas of analytical and bioanalytical chemistry by viewing this collection.

In the present challenge, the elements and their representations in the Periodic Table are the topic. And please note that there is a prize to be won (a Springer book of your choice up to a value of €100). Please read on...

Meet the challenge

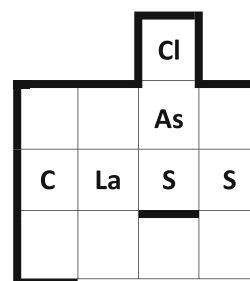
Chemistry is confronted with an ever increasing level of specialization, whereby scientists may over time become less firm on parts of the Periodic Table of the elements that are not so frequently encountered in their field. As the Periodic Table celebrated its 150th anniversary in 2019, we think it might be of value to re-establish the broader view on the range of naturally occurring elements and make the readers recall their high school lessons by setting up this *element crossword* challenge. It consists of a crossword puzzle, which is a modification of the conventional crossword. Instead of a single letter, an element symbol has to be entered in each field. Such puzzles have been around for some time already and the Royal Society of Chemistry has even released editions of *Chemistry Crosswords* books [1].

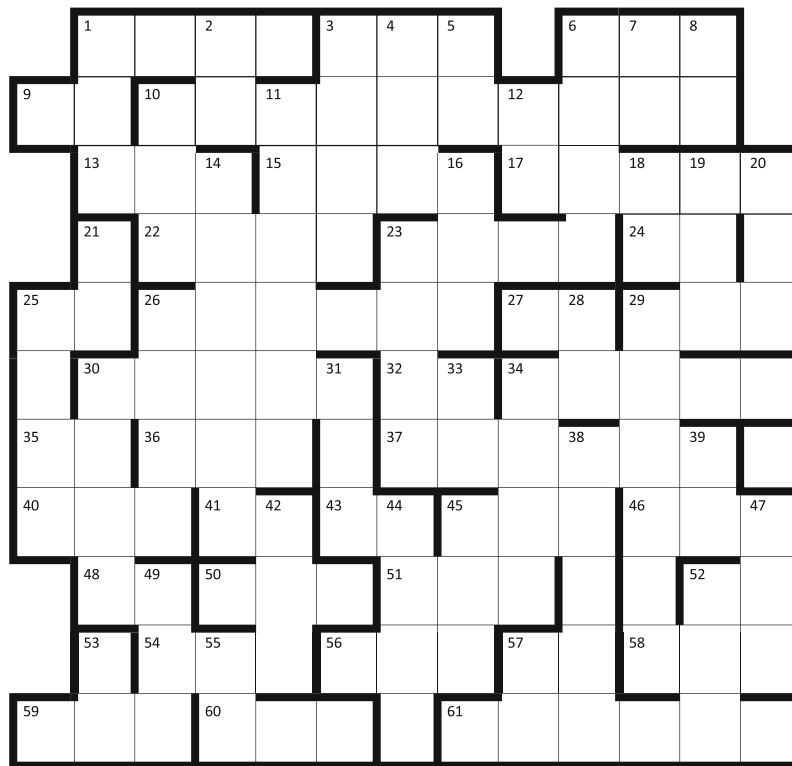
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This challenge is meant to combine a fun part (solving the puzzle) with the intellectual/educational act to refresh the knowledge about the naturally occurring elements and their representations in the Periodic Table. The combination of different symbols in a sequence that produces a real meaning requires a good overview about the letters and their combinations as they appear in the Periodic Table. A skill to permute the individual symbols to create suitable words that fit to the questions is certainly another benefit to solve this challenge. We believe that this challenge can help to mitigate the frequently observed “narrow” view of the Periodic Table, which can result from the increasing level of specialization occurring also in the analytical chemical world.

As most element symbols consist of two letters, answers can, but must not, be longer than actually represented by the number of fields. As in conventional crosswords, the symbol present at the crossing fields will be shared between the “down” and “across” answers and both words contain the letters present in the symbol in their normal sequence. We hope that this puzzle finds a broad resonance amongst the readers of *Analytical and Bioanalytical Chemistry* to contemplate about combinations that might be the solution to the puzzle and recap the entire wealth of the Periodic Table. This puzzle only uses IUPAC symbols of naturally occurring elements to narrow the selection a bit. Be aware that a particular word may be obtained by combining different combinations of symbols: As an example, “class” could be realized by these two different combinations:





The challenge

Across:

1 Concerns vision and perception. **3** Noose, frequently found in a drummer's set. **6** Show off to impress me. **9** Not to cross if red. **10** Not a state you want your gadgets in. **13** Released their Power in 1990. Tear. **15** Once a time. **17** A drink, a push, a blow. **22** A close one at a funeral. **23** HiFi aims to make it truly realistic. **24** Previously. Add a Big Apple for pain. **25** S(h)ort of a firm. **26** Eternal and mostly ethereal surrounding. **27** Rules from an authority. **29** Possibly the result of a shr(i)ek. **30** Displace as a higher authority. **32** Un-less. **34** Keeping the eyes on the horizon might help if this. **35** Romantic movie land. **36** Manifests in 19 down. **37** Turn off 58 across. **40** A condition of being tight. A time of speech. **41** Applies to about 50% of humans. **43** Is greater than this by forty two. **45** A typical dosage of 52 across. **46** Decorative element in a pond maybe. Complain grumpily. **48** The Boss (in enterprise terms). **50** Limb-wrap. **51** This hole is not fascinating. **52** Extracts made in various flavors. **54** Carnivores. A sword shaken. **56** Reliable. **57** Path for life of oriental origin. **58** What 16 down can do. **59** A lure for 54 across. **60** Comfortable. **61** What else could it be (here at the end)?

Down:

1 Seen more than once. **2** Was, then. **3** Joins with market, man or vision. **4** Popular dimension of the tiniest things. **5** Short for leisure, note or bill. **6** Imperial representation of gravity? British trade unit. **7** Anti off. **8** Isolation at its best. **10** Electron mover **11** Fleecing? No! Do this to your home! **12** Generously given, thankfully accepted! **14** Meant to be absent when abiding the 27 across. **16** Airborne's detector. **18** Not for horse racing, not for a good mood. **19** A possible manifestation of 6 down. Not a note. **20** Keeps your door in place. **21** Resembles density. **23** You may want to hear it from a priest—not your neighbor. **25** Complex by multiple means. **26** Anti-box? **28** Representation of time gone by. **29** To give a rather negative feedback. **30** Good to have for your working life after your work-life. **31** A sort of fuzziness seen around a saint's head. **33** Back. **34** Your password should be this. **38** Left? Right? A choice. **39** What a grill ideally does to the outside only. **42** Greek god of arrows. Love it. **44** Interstellar "fog." **45** Center! Carbonaceous metal-rich mineral?? **47** Over. **49** Do what you are told! **52** Decades, in years. **53** Ice creams crispy companion. **55** Structural element in wider spans. Almost central element of a monarchy. **57** A mouthful in Southeast Asia.

Reference

1. Chemistry Crosswords, RSC Publishing, 8 Dec 2016, ISBN: 978-1-78262-890-3.

We invite our readers to participate in the Analytical Challenge by solving the puzzle above. Please send the correct solution to abcchallenge@springer.com by July 1, 2020. Make sure you enter "Element crossword challenge" in the subject line of your e-mail. The winner will be notified by e-mail and his/her name will be published on the "Analytical and Bioanalytical Chemistry" homepage at

<http://www.springer.com/abc> and in the journal (volume 412/issue 25) where readers will find the solution and a short explanation.

The next Analytical Challenge will be published in 412/17, July 2020. If you have enjoyed solving this Analytical Challenge, you are invited to try the previous puzzles on the ABC homepage.

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