

April 2023

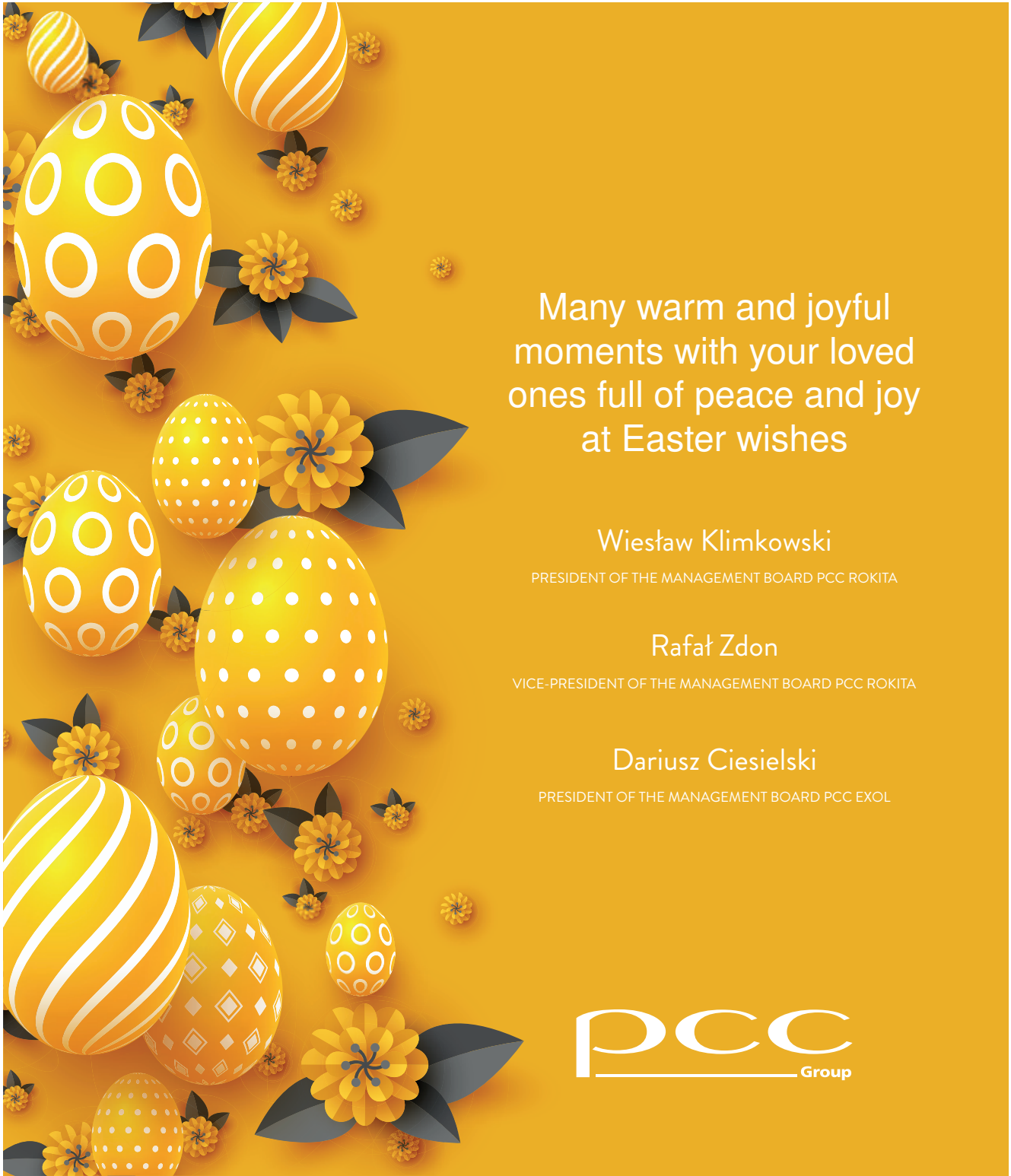
PCC

CHEM NEWS

Newsletter of the PCC Rokita Capital Group and affiliated companies

*Happy
Easter!*





Many warm and joyful moments with your loved ones full of peace and joy at Easter wishes

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PCC CHEM NEWS

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Explore the unique world of chemistry with *the PCC Group's Chemical Academy!*

Chemistry is a vivid and surprising field of science, one that has always fascinated people. We discover its secrets during chemistry classes, in academic laboratories or in research departments. It's worth remembering, however, that chemistry accompanies us in every area of life, and its various forms are truly intriguing.

All those interested in chemical secrets and discoveries are welcome to have a look in the virtual knowledge base in the form of the PCC Group's Chemical Academy!





The publications offered by our Academy allow you to learn the basics of chemistry, but they can also enrich your knowledge of its various areas. You can learn here the secrets of the periodic table or find out what pH indicators are, but you can also get acquainted with more advanced concepts of physical or nuclear chemistry.

The PCC Group's Chemical Academy was created primarily with pupils, higher- and lower-education students as well as all chemistry lovers looking for knowledge presented in an accessible and interesting way in mind.

Education of young chemists is the future of the chemical industry, which is why all Academy publications direct young beginners to the PCC Group's internship offer prepared by our HR team. University graduates at the verge of their professional careers are encouraged to learn more about job vacancies open at our companies.

Come explore the world of chemistry with the PCC Group's Chemical Academy!

Marta Lipka

Marketing Specialist
Content Supervisor of the PCC
Group's Chemical Academy



<https://www.products.pcc.eu/en/chemical-academy/>

Of what's in those containers

What can you find in containers transported using PCC Intermodal trains? In short, pretty much everything. However, we won't list here raw materials and intermediate products or chemicals with mysterious names, like Sodium Lauryl Ether Sulphate, to decipher which most of us would need a dictionary. These "mysterious names" are usually PCC Group products, whose transport is organised by a dedicated 5-person department, so there's a lot of it!

This time, however, we'd like to open for you the containers with everyday items. But not to reveal all the cards at once... before we "show" you what can be found in our containers, we'd like to announce a contest. The question is: what did we transport the most of in 2022?? And we're not asking for the name of a chemical compound, a group or a general category of products. We're asking about one specific product that everyone knows and that has certainly been used by you more than once.

The first ten people to e-mail us the correct answer at:

marketing.intermodal@pcc.eu

will receive a little PCCI container with a surprise inside





Next places on the list of what is loaded/unloaded at our terminals are taken by, for example: household appliances, furniture and clothing. This is a significant part of cargo we handle since, among other things, we have signed transportation contracts also with direct producers, market leaders in their branches of economy. Energy drinks, sunflower and rapeseed oil and flour rank quite high, followed by beer and sugar... straight to the kitchen to bake a cake with all of that. We transport a lot of canned food, tomatoes, cucumbers, maize, everything in cans, marinated in jars, perfect for a party with whiskey or wine. House renovations come along nicely with us, too: we transport a lot of ceramic tiles, floor panels, screws and nails... to be hammered in.

The goods our trains transport show us when the season's about to change... and not only the season, they show us clearly any shifts in trends, fashion or consumer behaviour. For example, after the introduction of photovoltaic co-financing programmes, our containers are more often loaded with panels, and following eco-trends, we load fewer plastic bags in them than we used to. Now the world is preparing for the arrival of spring and

summer, judging by the contents of our containers. Since the beginning of the year, we've seen an increase in the transport of bicycles and bicycle parts as well as sports clothes and accessories... the body must be in shape for the season, and looks like the customers are already well up for it.

Among other curiosities, we also transport: carpets, windows, car seats and wafer bars. But the containers can also be loaded with baubles. We transport all these things in our various containers: 20', 30', 40', tanks, reefers. We also have over 350 of our own 45' PCC containers. A producer can load up such a 45' container with 33 Euro pallets, which is over 26 tons of e.g. crisps, and doesn't even have to worry about anything at all, just load, close and seal it, and we take care of the rest!

The things we transport come in thousands! We're waiting for your guesses as to that ONE item that reigns on our list.

PCC Exol sustains gold in the EcoVadis platform's rating

The Company's increasingly higher rating as part of the supply chain for many global companies.

PCC EXOL has once again sustained the gold level of corporate social responsibility awarded by the analysts of the EcoVadis platform.

This very high rating has placed us in the group of 5% of the best-rated organisations in the world, and in the group of 3% of the best-rated manufacturers operating in the cosmetics and detergents industry.

As a chemical manufacturer, we were invited to report on the EcoVadis platform as a participant in the supply chain of 56 global companies representing various industries. These include, among others: Groupe L'Occitane, Shiseido Company Ltd, L'Oréal, Groupe Rocher, Quaker Houghton, LyondellBasell, DOW, Saint-Gobain, Sika, Azelis, Henkel, Brentag, Solvay, Bayer, Evonik, BASF, Clariant, Merck, Covestro.

Given the global scale of EcoVadis business, PCC EXOL is one of the internationally active chemical companies that regularly perform comprehensive self-assessments as part of their sustainable production and consumption efforts and social responsibility operations.

The Gold CSR rating obtained by our Company is a recognised distinction, awarded for pro-eco development and achievements in areas related to the environment, employment, fair business and ethical practices and the supply chain.

Today, the EcoVadis team evaluate reports from over 100,000 organisations from 170 countries around the world.

The platform's statistics prove that sustainable development practices are being implemented in both highly developed countries and regions that are still at the beginning of their path to stable economic growth. What's more, the EcoVadis assessment is one of several key elements of the supplier qualification process for companies operating in various sectors of the economy around the world.

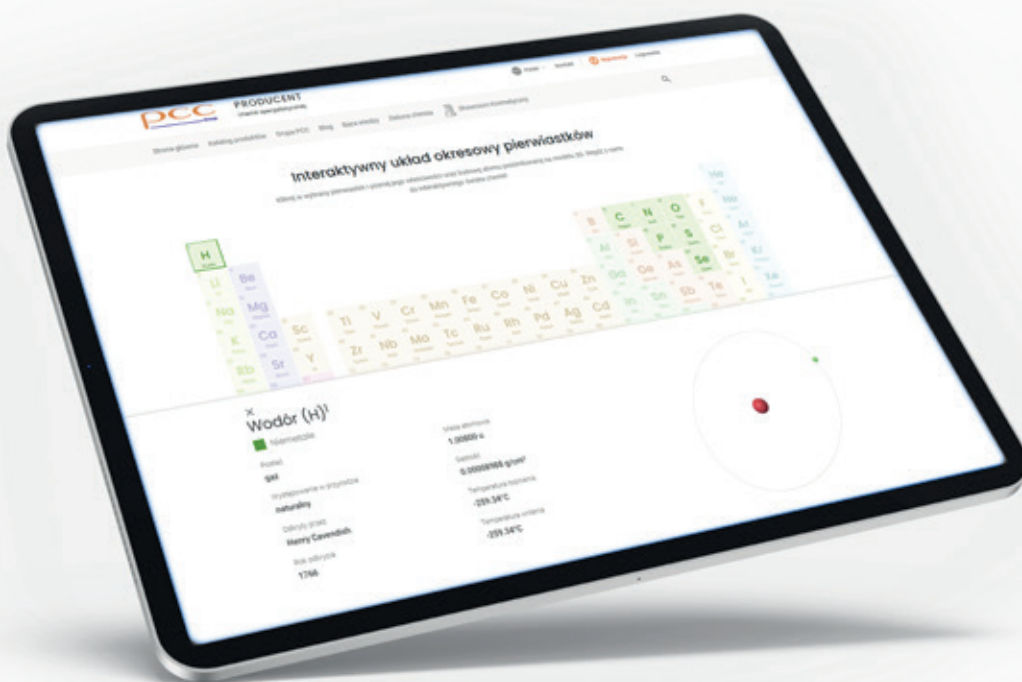
Beata Grus

Marketing Department Manager
PCC Group





EcoVadis operates the first internet platform that enables companies to assess contractors in the supply chain. The platform uses an original validation method and credible social responsibility assessment scorecards for companies representing various industrial and service sectors. EcoVadis makes it easier for businesses to reduce risks and improve innovation and efficiency in their logistics networks. The EcoVadis platform is now used by more than 100,000 companies reporting on their CSR-related operations in order to, among other things, increase transparency and trust between business partners.



The PCC Group have published their own interactive periodic table!

On 6th March 1869, Dmitry Mendeleev presented the world with the periodic table of chemical elements. The Russian chemist compiled in one table all the chemical elements known at that time, arranging them according to their atomic mass. He also noted that their properties repeat periodically.

Today, Mendeleev's periodic table of elements is the basis of chemical knowledge. Of all the ways of presenting chemical elements, this one has gained immense popularity and is generally used in the same form all over the world.

Its phenomenon has also inspired the PCC Group, which, making use of available technologies, has made its own, interactive periodic table of elements.

In addition to the standard list of elements following that by Mendeleev, this periodic table gives you the opportunity to see the model of the atom of each element in 3D.

Our new, interactive tool is a great learning aid for all pupils and students who want to explore the secrets of chemical knowledge. It can be found in the "Chemical Academy" section on the PCC Group Product Portal, in the "Knowledge Base" tab.

Go on and have a look!

** By publishing the interactive periodic table of elements as a tool for educating children and teenagers, we implement Sustainable Development Goal No. 4 of the UN 2030 Agenda – "Quality Education."*

Beata Grus
Marketing Department Manager
PCC Group

<https://www.products.pcc.eu/en/interactive-periodic-table-of-elements/>





Another PCC Group Showroom

i.e. bloody rim and other product proposals for the Auto Care industry!

Car enthusiasts know very well that a bloody rim is an effect caused by a chemical agent used to clean car wheels, where dirt, dust and brake block deposits accumulate.

You can learn more about the chemical composition of this as well as other car wash and care products by travelling around the new, multimedia studio of the PCC Group, dedicated specifically to the Auto Care industry.

By clicking on the flashing points on individual vehicles, you can see the proposals of various types of car preparations and cosmetics containing raw materials and additives produced by PCC EXOL SA – an industry manufacturer of surfactants and formulations.

These products include, among others, surfactants with washing and cleaning, wetting, foaming and complexing properties, as well as antistatic agents, solubilizers, emulsifiers, foam stabilizers and many others.

The offer for the Auto Care industry is being developed dynamically, so there will be more and more formulation proposals coming over time. They will soon be available in our multimedia studio.

Come have a look!

Beata Gruš
Marketing Department Manager
PCC Group

See the PCC Group showroom for the Auto Care industry!



<https://www.products.pcc.eu/autocare-showroom/>

Around the world in 365 days

It's been one year since the war in Ukraine broke out. In the first days of the intensified conflict, PCC Intermodal stopped providing services from, to and through Belarus and Russia.

Already in February 2022, decisions were made to close intermodal connections to the East (via Belarus and Russia) that have been developed for over 10 years, including such to Mongolia, Kazakhstan, Japan, Korea, or to take in through the PL/BY border containers travelling along the silk route.

"I was very proud that my company chose to act so honourably. It's not common today to give up benefits in the name of higher values. Brest has been developed at PCC Intermodal for as long as I can remember. Before achieving daily connections, this route had many ups and downs. I remember times when trains from the east came full and returned completely empty. We learned everything from scratch. Eventually, we were able to do everything ourselves, and our marketing efforts began to bear fruit. We got to the point where companies, even as big as IKEA, called us themselves and asked if we would take their loads to Moscow. And in one moment, it was all over. But it was the only way to go. It's good to know that you belong to an organisation that puts decency above profits," says Kasia Źklejewska-Krawczyk, Senior Marketing Communications Specialist.

After the eastern product's been closed, the team that had been servicing regular routings through Brest (BY) has intensified their efforts to stabilise intermodal services from and to Ukraine, despite the difficult economic and political situation, and thus, with the consent of the Management Board, all energy and resources have been focused on a new and growing direction.



"It was a great challenge for both the operational and terminal departments, but also for customer service. Working on the Ukrainian direction provides us with new experiences and teaches us how to overcome many difficulties," says Natalia Dzierżyńska, Customer Service Team Coordinator (to/from Ukraine).

"In a short time we had to learn how to handle customs and commercial documents in relations with our Ukrainian partners. The team of colleagues supervising railway operations was very helpful, showing understanding for the changing conditions, organisational difficulties and border controls. We had each other's back. Such experiences have cemented the relations within our team well. We were... are together for better and for worse," adds Paulina Zalewska, Customer Service Specialist in the Ukraine Connection Development Department.

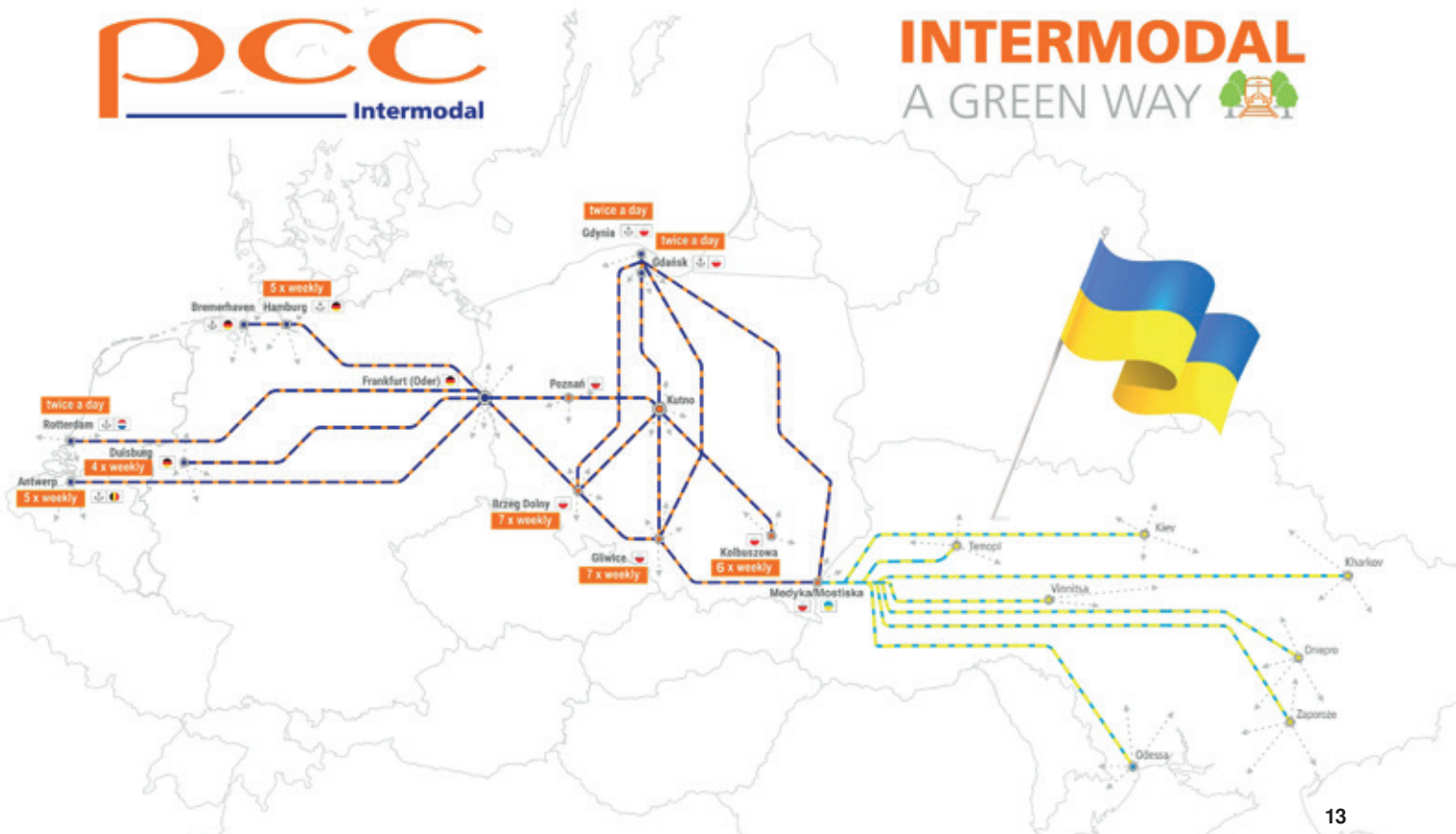
"As someone from Mariupol in Ukraine, from the very first day of my work in the Development Department of PCC Intermodal, I'd hoped that we would one day be able to develop regular connections to/from Ukraine. The border infrastructure was very poor. I knew it wouldn't be easy. Today I guess I should say that these hopes have come true, we made it, we go to Ukraine. Between 24th February 2022 and 24th February 2023, we handled over 6,000 customer containers. It's a great success, and this includes containers with humanitarian aid. It's a pity, though, that all this is happening in such tragic circumstances..." Vladyslav Chelpanov, Logistician.

The news of the war in Ukraine hit the world last year. A year has passed since and the war is still being fought. Life goes on. Some live better, others worse. And so for 365 days, all over the world. In transport, we know the rule not to

make the same mistake twice. To get better with the experience gained. But also to reach for the impossible.

Regular trains from/to Ukraine, closely correlated with the network of PCC Intermodal connections in Western Europe, launched and developed in a situation of ongoing armed conflict – what seemed impossible... has become a fact. And so today, despite the difficult situation in Ukraine, any company that has to transport a container, even if just one, whether from or to Ukraine, can use the intermodal solution, can have their cargo safely reach any place in the world all throughout the 365 days of the year.

PCC Intermodal





The PCC Group Product Portal's year of gold!

2022 was a YEAR OF GOLD for the PCC Product Portal. Presenting the offer of the Group's chemical companies, the product platform received from Google as many as 4 gold plaques for excellent results in terms of the number of internet user visits. This means it had been recognised as one of the best online sources of information four times within one year. Google awarded our Portal with a gold plaque in April, May, June and September last year.

In 2022, the PCC Group's Product Portal reached an absolute record in the number of visits. The website was visited by almost 3.5 million users. What's more, this result is higher than the sum of all the visits the Portal had had in all previous years!

It's also worth mentioning that, most often, internet users reach the PCC Group's Product Portal via the BLOG, which in 2022 generated over 2.5 million

visits by users living in 231 different regions of the world and speaking altogether 700 different languages and dialects.

Beata Gruś
Marketing Department Manager
PCC Group

pcc
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CONTENT OF THE PRODUCT PORTAL IN NUMBERS 2022

155
articles published

105
blog articles

35 PCC Group
Chemical Academy posts

15
sponsored publications

Over **1 000 000**
characters of content written

555
A4 pages written

2 500 000
visits to the PCC Group blog and the Greenline blog in 2022

TOP 5 most frequently read blog articles in English:

- 1 10 most important events in the field of chemistry in 2021 | PCC Group
- 2 Photovoltaic panels vs. solar panels – differences – PCC Group Product Portal
- 3 Raw materials for the production of natural cosmetics – PCC Group Product Portal
- 4 Soap production – natural and synthetic raw materials – PCC Group Product Portal
- 5 How are colours created and why do we see them? Colour models and methods of their description – PCC Group Product Portal

All blog articles on the PCC Group Portal are translated into 3 languages – English, German and Russian, and into 12 language versions automatically translated.

Creative meetings with the PCC Group!

Between 16th and 18th January, the PCC Group was visited by about 180 8th-year pupils from Brzeg Dolny's primary schools. We hosted guests from the School and Pre-School Complex No. 1, the School and Pre-School Complex No. 2 and the School and Pre-School Complex No. 3.

The students visited our company's laboratories and learned the secrets of making soaps and foams. After the workshops, they met with representatives of the HR department, who told them all about the plans to create a Chemical Technical Secondary School at the Complex of Vocational Schools in Brzeg Dolny. We can now announce that the Technical School is to start in September 2023 – more details coming soon.

The students were also invited to take part in a game of Chemiliada (Chemis-

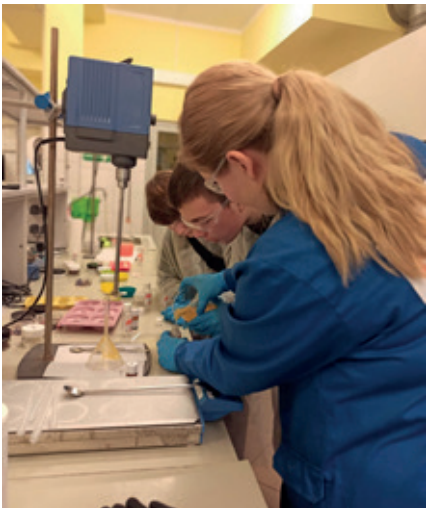
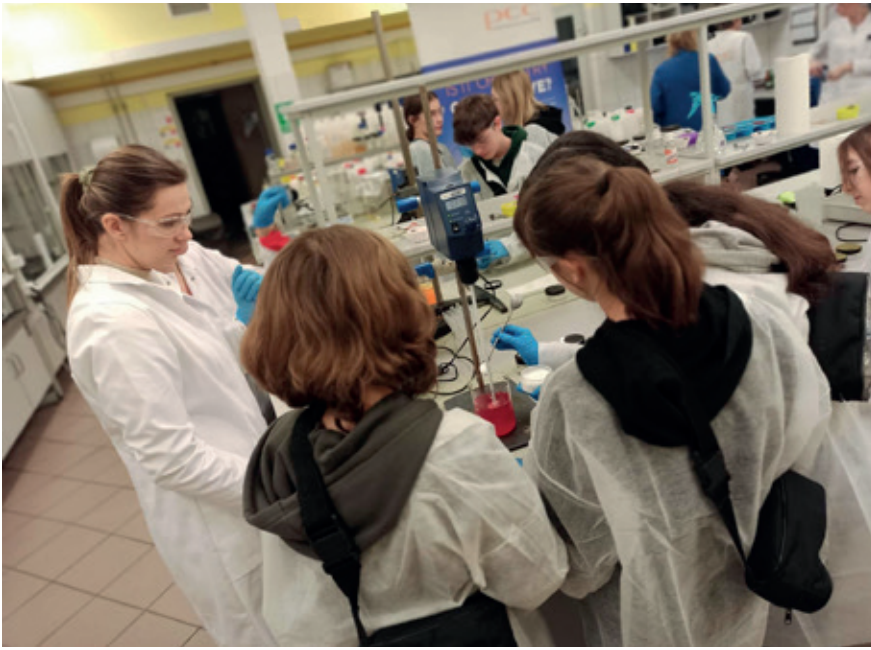
try Feud). Participants were divided into two teams – with truly ingenious names – and answered questions in the field of chemistry, all tinged with some competitiveness, but above all, full of good fun!

Those were some intense days, but the smiles on our guests' faces made it all worth it!

See photos from the event below!

Karolina Ławecka
HR Specialist
PCC Group







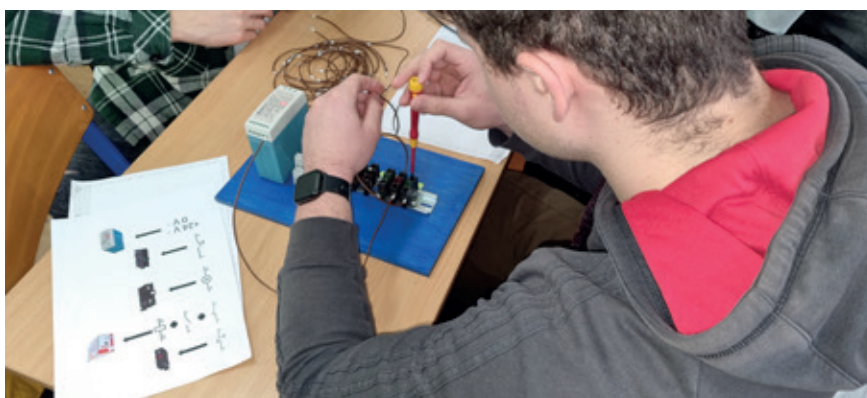
Workshops with *LabMatic*

In the last days of November, we visited the Wincent Witos District Complex of Schools No. 2 in Środa Śląska. We met with 55 students of IT technical and mechatronics classes.

Director Jakub Szachta, together with Labmatic specialists – Mariusz Sobierajski, Adam Maciejewski and Łukasz Schick, introduced the Labmatic company and prepared some technical tasks for students of the vocational and technical schools. The students had to build two industrial automation systems based on schematics. During the task, they had at their disposal: DC power supplies, relays, monostable on/off switches, sets of connecting cables and light bulbs.

The students were very eager to build the systems and, with a little help from our specialists, all groups managed to successfully complete the task and receive prizes bearing the PCC logo!

Congratulations to the students and thank you to the Wincent Witos District



Complex of Schools No. 2 in Środa Śląska for organising the meeting! We've already made arrangements for a return visit at PCC Rokita in Brzeg Dolny, so that the students can see how our maintenance services operate "in real life" to make sure that everything goes smoothly in the production departments.

We would like to thank our specialists and the director from Labmatic for their commitment and finding the "teacher" within themselves!

Izabela Dreja-Dulewska
HR Business Partner

The PCC Group

More than **1,300** chemical products
and formulations for various
industrial applications



Chlor-alkali products

Raw materials and
intermediate products

Consumer products
and packaging

Surfactants

Specialist
products

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products.pcc.eu

AI revolution in marketing

- are we facing a machine uprising?

When last year, at a marketing conference, I heard about the possible applications of AI in the daily work of marketers for the first time, I was convinced that it would take at least a few years for us to actually start feeling its real impact. I couldn't be more wrong. Artificial intelligence has taken the marketing industry by storm and become the leading topic of conversation and analysis. Without a doubt, we are on the brink of one of the greatest technological revolutions in history. It's time to get ready for it!





What is AI and its NLP component?

Artificial intelligence is a very broad and complex concept, which is why it is difficult to define it unambiguously (no such definition has been developed in either Polish or European legislation so far). Let us use a quote from a gov.pl website, then:

Artificial Intelligence (AI) is being defined as a field of knowledge that includes, among others, neural networks, robotics, and the creation of models of intelligent behaviour and computer programs that simulate these behaviours, including machine learning, deep learning and reinforcement learning.

We will take a closer look at only a small part of AI here – that which is most relevant to the internet marketing industry: Natural Language Processing (NLP). NLP allows computers to recognise, analyse and transform input data (human language, either spoken or written) into text, and to analyse it in the appropriate context, situation or as per available data, as well as the ability to generate feedback.

Most of us have already used this technology, probably without even realising it. Natural language processing technology is used by popular virtual assistants such as Siri or Alexa. NLP is also used by Internet search engines and spam filters in our mailboxes. The Google search engine, too, has been using AI for several years. The Mountain View giant's algorithms, such as BERT, allow the search engine to better understand the context of user queries, thus providing results that are more relevant to the intent of the inquirer.

ChatGPT - 1 million users in 5 days!

One might ask: that's all very nice, but where's this revolution? After all, the above-mentioned programs and services have been with us for a long time. Well, the revolution came in 2022 and was brought to us by the OpenAI company (one of its founders is Elon Musk himself) and its ChatGPT – an AI tool with a trivially simple interface. At that point marketers, but also: schoolchildren, students, researchers, programmers, managers, etc., received a free (for now), easy-to-use tool that – in a matter of seconds – can, among others:

- write any, absolutely unique text (an essay, article, blog entry),
- provide unique advertising slogans and taglines,
- create advertising campaign content of any kind,
- outline a marketing strategy,
- write code in all programming languages,
- create a business plan,
- and much more.

ChatGPT is trained on massive amounts of textual data and can generate highly realistic and consistent responses. The data that the GPT engine learns on is obtained by scanning global Internet resources, and a non-profit organisation called Common Crawl is responsible for this process.

It's worth remembering that OpenAI is based on four different language models, and their data is not collected in real time. Which is why, if you ask an ADA model robot (text-ada-001) about the war in Ukraine or the Covid-19 pandemic, you won't get the correct answer. The situation will be different in the case of the DaVinci model, whose data goes back to June 2021 (text-davinci-003). What other differences are there between the above-mentioned engines? First and foremost, they differ in the level of advancement and processing capacity in relation to the maximum number of queries sent. DaVinci is the most developed and largest model, one that is perfect for working on content. ADA, in turn, is the fastest and cheapest model to use. Therefore, the choice of the engine should be made depending on the purpose and complexity of the task you want to accomplish.

The extraordinary possibilities of ChatGPT are evidenced by the number of its users, which has grown to 1 million in just 5 days. For comparison, it took Netflix 3.5 years to achieve the same result, and Facebook – 10 months.

Interesting fact

Apart from Elon Musk, one of the co-founders of OpenAI is a Pole – 34-year-old Wojciech Zaremba from Kluczbork.

Interview with Wojciech Zaremba:
<https://www.youtube.com/watch?v=U-5OD8MjYnOM>

Prompt engineering - the art of talking to AI

The quality of the response you get from AI depends on how many prompts you use. A prompt is nothing more than a command that you give to artificial intelligence. It's up to you how many lines of text with guidelines you provide and how many assumptions you outline. Searching for inputs that bring desired or useful results once entered into the language model is the foundation of prompt engineering.



Here's an example conversation with ChatGPT

I want to write an article on waste segregation that could guide children and students on how to segregate waste at home. Suggest five subheadings that will constitute the structure of the article as well as contain the most important issues related to waste segregation at home.

Here are five suggestions for subheadings that can form the structure of an article on waste segregation for children and students:

Why is waste segregation important?

- Discussion on the importance of waste segregation for the protection of the environment and natural resources

What types of waste can be sorted at home?

- Presentation of different categories of waste that can be segregated at home (e.g. paper, plastic, metal, glass, bio-waste) and their characteristics

What are the ways to segregate waste at home?

- Practical tips on how to effectively segregate waste at home, e.g. using special containers, bags, binders or labels

What to do with each type of waste?

- Examples of ways of managing individual types of waste, e.g. processing into secondary raw materials, composting or disposal

How can you contribute to environmental protection by segregating waste?

- Discussion on the benefits of proper waste segregation for the environment and for ourselves, encouragement to change habits and manage waste responsibly at home.

Write a few sentences in each point. In point 1, include the keyphrase "segregation of waste at home." Remember to write your answer in words that pupils can understand.

Of course, here are the explanations:

Why is waste segregation important?

Segregating waste at home is important because it allows you to

- Protect the natural environment against pollution, which has impact on human and animal health and natural resources
- Reduce the amount of waste going to landfills and increasing the amount of secondary raw materials that could be used in the production process
- Reduce the costs of waste management incurred by residents, institutions and companies.

This dependency can be easily transferred to actual aspects of your work. If, for example, you ask a copywriter to write a text related to chemistry, you will get a completely different result than the one you get if you were to extend your request with additional parameters, such as: a specific field of chemistry, a specific product group, or keywords to be used.

Remember that, depending on what level of detail and what language form you want your content to have, you can outline the appropriate role for AI – and the results will be completely different. Your prompts can do more than indicate the topic and target group. You can ask AI to take into account your goal or to convey specific emotions.

Interesting fact

An experiment carried out by Northwestern University (USA) has shown that professional reviewers of scientific journals have a problem with detecting abstracts written by AI.

Source: <https://news.northwestern.edu/stories/2023/01/chatgpt-writes-convincing-fake-scientific-abstracts-that-fool-reviewers-in-study/>

GPT-3 not only for content – meet DALL·E

At the beginning of 2021, OpenAI presented its next project – DALL·E. In the simplest terms, it is an AI-based interface (GPT-3) that creates images and videos based on entered text.

So let's ask the AI itself about how Dall-e works.

Dall-e is an artificial intelligence program developed by OpenAI. Its task is to create images based on sentences and descriptions. The program processes natural language in the form of text and generates a visualisation. What sets Dall-e apart is its ability to create images based on highly abstract descriptions.

Examples:

- Dall-e can generate an image of an alien in outer space based on the description: "An alien jumps through outer space."
- Dall-e can generate an image of a funny creature based on the description: "A creature with small green ears, a green nose and a big smile."

Once the prompts are entered, Dall-e analyses billions of images on the web. The condition is that they have so-called alternative descriptions, through which the system identifies what is in the image. Thanks to this, the algorithm is able to recognise the phrases entered by the user and combine them with given graphics, thus creating combinations limited only by one's level of creativity.

Interesting fact

Artificial intelligence has won a fine arts competition.

Jason Allen won a local art competition held in Colorado, USA, sparking a wide debate on the use of new technologies in the creative process.

Source: <https://impakter.com/art-made-by-ai-wins-fine-arts-competition/>



Here is an example of an image generated with the following prompt:

“Create a realistic image of a chemical plant at night. Add an orange fog over the plant.”



The future of AI. Can GPT-3 replace humans?

It is a fact that some companies have already been trying to replace content creators and copywriters with artificial intelligence. Should journalists, copywriters, writers, programmers, etc. worry? Will "rebellious machines" drive them out of the market? In my opinion, no. But there's no doubt people involved in creating content will be forced to acquire new skills. The art of talking to AI will be an integral part of everyday work. Copywriters will become "supervisors" of the machines' work. Content creation will be a hybrid

process. Under human supervision, artificial intelligence will allow for more creative and faster content creation, and the development of prompt engineering will become the key to the marketing industry.

Kamil Plewka
Online Marketing Coordinator
PCC Rokita S.A.

Kaizen in everyday life

Most probably, every single one of us thinks about changing something in their life for the better. On the one hand, you want to change something, on the other, something's preventing you from acting on it. What's stopping you? Is it FEAR? You're afraid of whether you're capable, whether you'll manage, you don't believe in yourself. Perhaps you lack skills, knowledge, or abilities, or prefer to stick to what you're familiar with, what is certain and SAFE for you. You quickly become used to the current situation, and despite being dissatisfied with it and wishing to change it, you're not able to.

When we decide to make a change, we often start with the so-called innovation strategy, i.e. drastic changes. Innovation is fast and can produce noticeable results in a short time. In everyday life it can be, for instance:

- a diet that requires you to give up your favourite foods,
- quitting smoking overnight,
- radical plans to get out of debt.

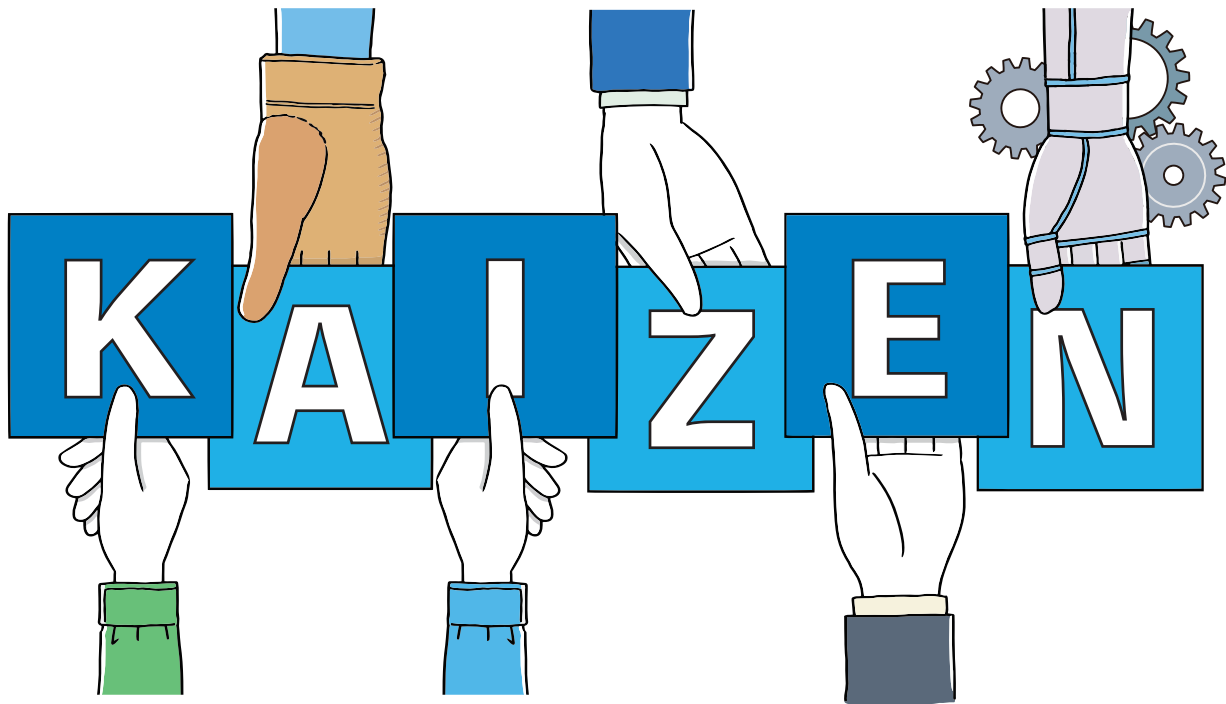
If you're successful, you can congratulate yourself. However, it may, just as well, happen that you fail, and this may only discourage you from further attempts to change, increase your anxiety and further lower your self-esteem, leaving you feeling guilty for being defeated. The problem with such radical actions is that even if you succeed, the success may be temporary as you're not capable of sustaining it once the initial enthusiasm has faded.

Fortunately for us, radical actions are not the only way to achieve effective change.

There is also a nice, easy and light-hearted strategy of small steps – the so-called Kaizen philosophy. One might say it even allows you to overcome the fear of change as it allows you to reprogram your brain so that it doesn't resist other actions that you want to introduce, and at the same time, willingly join the entire improvement process, while stimulating rational thinking and a creative approach.

"**Kaizen**" is a Japanese word that means improvement, change for the better. The Kaizen philosophy shows how to take small steps towards a change for the better – and small steps lead to big changes.





Here are some of the techniques for using the Kaizen philosophy in private and professional life:

➔ Ask small questions

If you're pursuing a specific goal, try asking yourself, "What can I do to get even a little closer to my goal?" All you need to do is adopt a gentle tone, whether you ask the question out loud or in your mind. Your brain will start looking for an answer.

➔ Think small thoughts – sculpting the mind

Used by those who are aware of what action should be taken, but are not mentally ready for it yet (so-called procrastination). For example, you need to drink more water, and every day for 15 seconds you imagine that you are drinking a glass of water with relish. Once it becomes a regular practice, you can increase the time to 30 seconds. The next stage is about taking small actions (drinking water).

➔ Take small actions

By taking small actions, you are able to avoid obstacles that could potentially lead to failure. Small actions are at the heart of Kaizen and form the basis of Kaizen programmes. Such actions should be very small – ridiculously small, one might say. For example, if your goal is to start exercising, apply the Kaizen philosophy: run for literally five minutes, or even fewer. There will come a time for running for 30 or more minutes. Small actions trick your brain and allow you to create new habits that will last.

➔ Solve small problems

Try to solve problems while they're still small. It's much easier. An unresolved problem can grow into a really big one and become much more difficult to solve. If you're facing a problem, ask yourself, "What might be the best possible solution to this situation for me?"

➔ Give yourself small rewards

Small rewards are the best incentive to act. They're cheap, they allow you to show gratitude to yourself, but above all they activate the intrinsic motivation that is necessary for making lasting changes.

➔ Identify small moments

To notice small moments you need to have an open mind and be curious of the world. Develop these skills and you will increase your chances of recognising potentials.



Practical examples of implementing the Kaizen method in everyday life

Kaizen and saving money

How to make savings according to the Kaizen philosophy? If you earn a good salary but still don't have enough money, it's worth implementing a small savings plan. There is a phenomenon that consists in regularly spending small amounts on little pleasures that you often don't really need, and it's called "the latte effect." Taking this latte in the city as an example here – maybe small instead of large, or maybe just make yourself a coffee at home? It's not about giving up fun things altogether, but rather about analysing what you actually buy. Perhaps there is something in your daily routine that can be changed or limited.

Kaizen and physical activity

Dreaming of taking a 5 to 10-kilometre jog every day before work? You don't have to decide on hour-long workouts straight from the get-go as it could be discouraging and, consequently, could make you abandon the idea of introducing such an activity in your everyday life. What if you start with brisk 10-minute walks and then start extending the time by two more minutes every day? This exactly is the small steps approach to achieving a goal without any revolutionary changes.

Kaizen and learning a foreign language

Want to speak a different language? Maybe it would be a good idea to start by learning a few words or a simple phrase a day. You don't necessarily need to be fluent in the language right away. Doing it this way, you won't feel discouraged from learning, but every step will still bring you closer to your goal.

Kaizen and losing weight

Dreaming of losing weight? You don't have to immediately go on restrictive diets and give up all your favourite foods. It's best to focus on small changes that you are able to accept and gradually get used to. If your meals are too big, maybe it's enough to reduce their size – instead of two spoonfuls of potatoes for dinner, maybe just one will be enough? If you have a sweet tooth, maybe you could limit the amount of sweets you consume to get started? Or try and find a healthier alternative?

Joanna Baranowicz
Lean Coordinator
Grupa PCC

"When you improve a little each day, eventually big things occur. When you improve conditioning a little each day, eventually you have a big improvement in conditioning. Not tomorrow, not the next day, but eventually a big gain is made. Don't look for the big, quick improvement. Seek the small improvement one day at a time. That's the only way it happens – and when it happens, it lasts."

John Wooden
one of the most famous coaches
of the youth basketball league

Sources:

Maurer Robert "One Small Step Can Change Your Life: The Kaizen Way",

<https://twojainspiracja.pl/kaizen-metoda-malych-krokow-dlaczego-sprawdza-sie-w-codziennym-zyciu/>

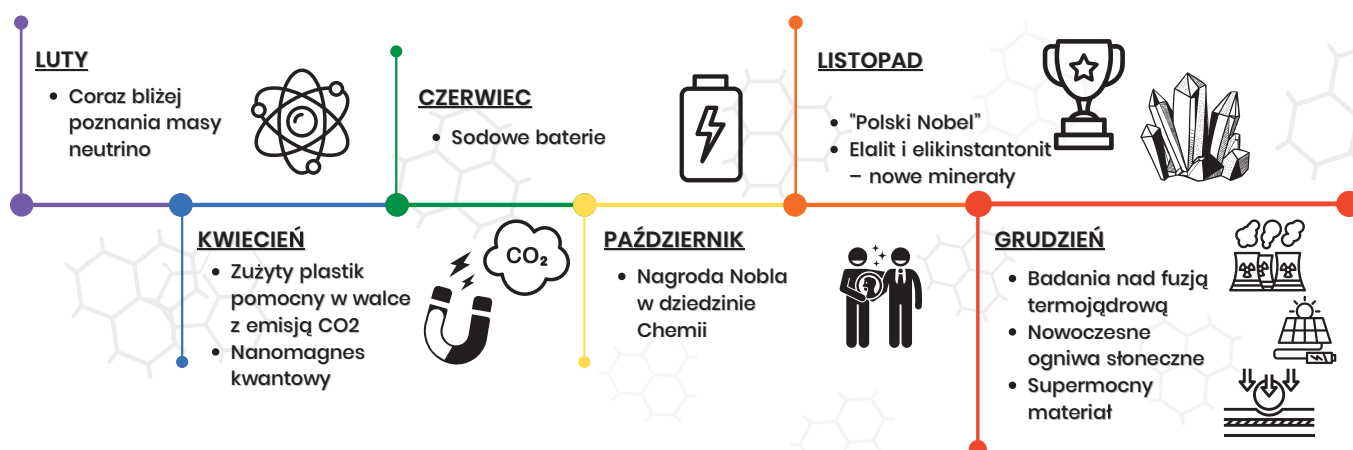


TOP 10

most interesting developments and discoveries in chemistry in 2022

- part I

For many of us, the beginning of a new year is a time to sum up everything that's happened. It's a moment we immerse ourselves in reflecting on our achievements, but also look with a curious eye at what has happened around the world. Socio-economic, political or climate changes as well as events of many other kinds have a huge impact on stimulating the development of science, which goes hand in hand with the development of technology and the spread of new trends. And so, the world of chemistry is changing as well, having both faced difficult challenges and brought many scientific novelties in 2022. In this issue of the Newsletter, you will be presented with the first five events and discoveries out of the most interesting news that have influenced the future of chemistry.





Getting closer to knowing the mass of the neutrino

(February 2022)

The existence of the neutrino was theoretically predicted in 1930 by Wolfgang Pauli. However, despite various theories and attempts, it was impossible to confirm its existence for a long time. The neutrino is unique in that it has no electric charge and interacts very little with other particles. Due to this, scientists had assumed that the neutrino had very little or no mass at all, much like a photon. However, knowing the mass of the neutrino could help us understand the universe even better, so the search for a method that would make this possible never stopped.

Research on the neutrino is carried out

by the international KATRIN project, led by the Karlsruhe Institute of Technology. The experiments that were done used the phenomenon of beta decay, which occurs in the atoms of the isotope of hydrogen, also known as tritium. The name KATRIN covers a specialised apparatus, including a huge spectrometer, necessary to measure the properties of electrons formed during decay. The research has been ongoing since 2019 and the results they are getting are increasingly better. In 2022, for the first time ever, they managed to go below the electronvolt limit during the measurement process, which was a very important achievement. This allowed them to de-

termine that the mass of the neutrino is no more than 0.8 eV. For scale, take the mass of the neutron - 0.938 GeV (billion electronvolts) or that of the electron - 0.511 MeV (million electronvolts).¹

The research conducted as part of the KATRIN project is expected to last at least until 2024, and scientists hope that during this time they will be able to obtain an even more precise measurement of the neutrino mass.²



Used plastic helps fight CO₂ emissions

(April 2022)

At this point in time plastics are mass-produced and can be found virtually everywhere. One of the most common packaging is the plastic bottle, which can be made of several different materials, which in turn, makes recycling difficult. Scientists are continuously searching for benefits that the use of recycled bottle material could bring, so that, despite being quite a complicated process, it becomes more profitable and more willingly used.

Research on the use of discarded plastic in the fight against high carbon dioxide emissions has been undertaken by

a group of chemists from Rice University. Information on the results they've obtained has been published in the "ACS Nano" journal.³ The publication describes that the performed research made use of the considerations on the pyrolysis process (decomposition of substances), which is currently used in the petrochemical industry. The process consists in heating up substances to very high temperatures in oxygen-free conditions.

In their experiments, the scientists used the process of plastic pyrolysis, carried out in the presence of potassium acetate.

This resulted in the creation of specific molecules with microscopic pores that give them the ability to capture and bind CO₂. Such material could be used to create a reusable carbon dioxide absorber. Thanks to this discovery, capturing a ton of CO₂ using such an absorber could become several times cheaper than current sequestration methods.⁴

¹ <https://www.nature.com/articles/s41567-021-01463-1>

² <https://www.national-geographic.pl/artukul/ile-wazy-neutrino-naukowcy-w-koncu-zwazyli-najlzejsza-czastke-elementarna-znana-fizyce-220216091750/>

³ <https://www.iea.org/news/global-co2-emissions-rebounded-to-their-highest-level-in-history-in-2021>

⁴ <https://pubs.acs.org/doi/10.1021/acsnano.2c00955>



Quantum nanomagnet

(April 2022)

A team of scientists from the Jagiellonian University announced the discovery of a new type of organometallic quantum nanomagnet, which they described in the "Nature Communications" journal.⁵ The central magnetic ion – i.e. an erbium ion – combines with three heavy rhenium ions. This combination made it possible to get closer to the properties

of the already known large macroscopic magnets.

Due to the fact that they require strong cooling during use, new molecular magnets will not come into use anytime soon. In order to find any practical application for them then, they need to be designed in a way that they can operate

at room temperature, which is another aspect to be further researched. Scientists claim, however, that these magnets could revolutionise the future, especially in fields such as computer science and electronics.⁶



Sodium batteries

(June 2022)

Lithium-ion batteries are used in most everyday devices. The production of such devices requires rare metals, such as cobalt, but also lithium, which is not a common element – and this has a significant impact on the production price.

Research has shown, however, that lithium could be replaced with sodium, which would reduce production costs. An additional benefit would come in the fact that sodium batteries would charge much faster, while completely depleting the battery would not adversely affect it. Scientists had, however, come across

an obstacle in implementing the idea, which lay in the fact that sodium formed metallic structures (dendrites) on the electrode, resulting in short life of such batteries.

This issue has been dealt with by a group of scientists from the University of Texas in Austin. They used a computer model to create a new material that prevents the formation of dendrites. As a result, it protected the electrode against damage. The material was created by depositing a thin layer of sodium on antimony telluride and then folding it multiple times

to form alternating layers. Thanks to this, a more even distribution of sodium was achieved, which resulted in slower and less frequent formation of dendrites. This discovery offers an opportunity to create a sodium battery that will have a comparable energy density to that of a lithium battery, and will match it in terms of the number of discharge and charge cycles.⁷

⁵ <https://www.nature.com/articles/s41467-022-29624-7>

⁶ <https://naukawpolsce.pl/aktualnosci/news%2C92110%2Cpolacy-stworzyli-magnetyczna-czasteczke-o-wyjatkowych-wlasciwosciach.html>

⁷ <https://www.national-geographic.pl/artukul/nadchodza-baterie-sodowe-tansze-od-litowych-rownie-sprawne-i-bezpieczniejsze-dla-swiata-211207050535>



Nobel Prize in Chemistry

(October 2022)

As in previous years, in 2022 the Nobel Prize in Chemistry was awarded as usual. The Royal Swedish Academy of Sciences awarded the Nobel Prize to Carolyn R. Bertozzi, Morten Meldal and K. Barry Sharpless, who were recognised "for the development of click chemistry and bioorthogonal chemistry."

Bioorthogonal chemistry is a field that allows us to monitor the chemical processes occurring in living organisms without damaging them. Thanks to this, we are able to study the course of dis-

eases inside cells, as well as in complex organisms. Click chemistry, on the other hand, is a process that is compared to building with LEGO blocks. Namely, given fragments of molecules can be combined with each other to produce compounds of great variety and complexity. Simple elements – which can be called "chemical building blocks" – allow you to create an almost infinite variety of molecule combinations.

Bioorthogonal chemistry and the click chemistry technology are especially sig-

nificant for pharmacy and medicine as they can have great impact on the development of these fields.⁸

You can learn more about previous Nobel Prize winners and their discoveries from the "The Nobel Prize in Chemistry" entry on the PCC Group blog.

These five interesting discoveries in chemistry are just a handful of all that happened in this field last year. I hope all this news has aroused your curiosity and made you look forward to the second part of the article, which is coming to you in the next issue of the Newsletter!

Marta Lipka
Marketing Specialist
PCC Rokita



⁸ <https://www.nobelprize.org/prizes/chemistry/2022/press-release/>

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PCC MCAA once again wins the company volleyball tournament

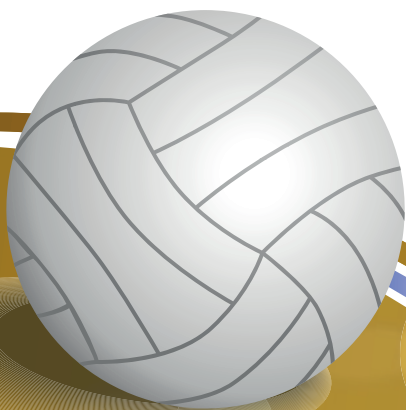
The first of the New Year's competitions for employees of the PCC Group companies is behind us as a volleyball tournament with 10 teams competing one against another took place today. The all-female team of LabAnalityka is deserving of particular attention as they competed against both men's and mixed teams! Congratulations on your sports spirit and attitude!

The PCC MCAA team turned out to be unbeatable, defeating all their opponents on their way to win this New Year's cup, and without losing even one set. The second place went to the PCC Apakor 1 team, the third to the KC team, and the fourth place to the ZSR team.

All tournament participants will receive prizes. Congratulations to everyone for participating.

Maciej Trubisz
Redaction







Physical fitness of the Company Rescue Service – confirmed!

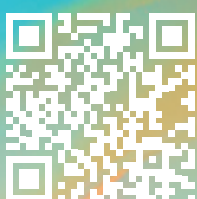
The Company Rescue Service defeated the PCC Apakor team in an extremely exciting final in a penalty shoot-out. The third place went to the LabMatic team, and the fourth to the CTP-3 team. The other teams participating in the competition did not go through to the knockout stage.

The title of top scorer was earned by Marcin Kokociński (ZSR) – 11 goals, and that of best goalkeeper of the tournament went to Waldemar Porowski (ZSR).

Maciej Trubisz
Redaction







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