

# EUCHEMS - EUROPEAN CHEMICAL SOCIETY Activities'

## Report - Year 2022

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#### 1. Introduction

Although the official declaration of the end of the COVID-19 pandemic was released by the Director General of the WHO only on May 5th 2023, that is more than 3 years after the declaration of global pandemic status, the global spread of the SARS-CoV2 virus was already reduced during 2022 and, above all, the declining of the most serious symptoms associated with the infection, has made it possible to resume meetings and scientific initiatives in person both in our country and in Europe, especially during the second half of 2022. This has allowed also to the European Chemical Society (EUCHEMS) to gradually restore its networking and international activities, consolidating its role of main representative of European Chemistry in the different fields that characterize the chemical sciences.

To complete this preamble is also worth stressing that the mission of EUCHEMS is to stimulate scientific discussions at any level by providing European chemists a qualified voice to authoritatively discuss on any issue relating to chemistry with politics, decision-makers and representatives of civil society as well as with the European industry.

According to the most recent data as of 31 December 2022, EUCHEMS brings together and represents over 130,000 European chemists belonging to 33 countries<sup>1</sup> and 49 European scientific organisations, of which 41 national scientific societies and eight other organizations that have joined EUCHEMS as "Supporting Members". With this latter legal capacity, the CNR has been part of this organization since January 2020.

#### 2. Main activities carried on by EUCHEMS during 2022 relevant for Italy and for CNR

Among the EUCHEMS institutional activities which have been highly appreciated by the entire European scientific community, are worth mentioning the organization of scientific events linked to some of the most critical elements of the Mendeleev's periodic table. The critical nature of these elements follow from their extreme scarcity, or from difficulties in their extraction or because they are associated to geopolitical constraints which severely limit their availability or excessively increase their cost. After the two webinars dedicated to the elements carbon and lithium held remotely in 2021, the series of scientific events on critical elements continued in 2022 with a scientific day dedicated to the element nitrogen. The day entitled *'The Nitrogen Element – Sustainable food production?'* was organized in the form of a remote workshop in webinar mode on April 26<sup>th</sup>, 2022. The initiative was, like the previous events of the series, coordinated by "EuChemS Periodic Table Task Group" chaired by Dr. Nicola Armaroli, Research Director of the Institute for Organic Synthesis and Photoreactivity (ISOF – CNR) of Bologna who is serving as coordinator of the Task Group.

The series of seminars will continue in 2023, broadening its horizon to include phosphorus, an element critical for the planet's food needs, and for which it is becoming imperative to establish and implement series of savings, recovery and recycling policies.

This activity is of great interest for our country and, in particular, for the National Research Council which has identified the chemistry for sustainable development as one of the main missions of the Department of Chemical Sciences and Materials Technologies and which considers the management of the planet's critical resources, one of the most important departmental research areas.

#### 3. Activities carried on by Maurizio Peruzzini within the Union during 2022 and impact on the Italian scientific community

The CNR representative within EUCHEMS participated in some remote meetings organized by Dr. Alessandra Quadrelli (CNRS Lyon, France) on behalf of the EuChemS Periodic Table Task Group to discuss the possible reassignment of the color code of two of the most significant elements that characterize the EUCHEMS Periodic Table (Figure 1). In particular, the change in the color assigned to two critical elements, lithium and carbon, were discussed and approved. The element lithium has gone from previous yellow code (limited

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<sup>1</sup> Since January 1st, 2023, the Lithuanian Chemical Society (Vilnius) was admitted to be part of EUCHEMS.

availability; risk for future supplies) to the red one which identifies it as an element at risk following the growing exploitation at a global level as a consequence of the colossal growth in the use of lightweight lithium batteries. The element carbon, whose availability in nature is anything but scarce, has instead been assigned a triple color: green, red and black to indicate that alongside high availability, it is necessary to consider the problems linked to the depletion of fossil resources due from their unsustainable exploitation (especially oil and methane). The third color assigned, black, testifies to the completely singular geographical distribution of hydrocarbons given that the majority of these strategic resources are concentrated in limited geographical areas which are often politically unstable if not even at the center of disputes and conflicts.

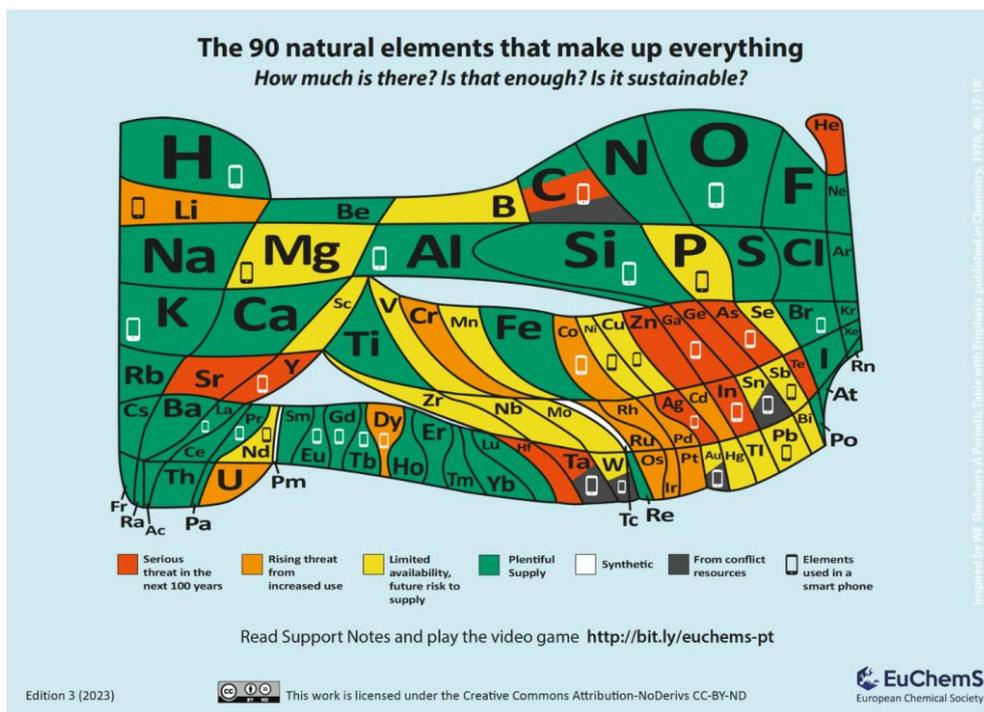


Figure 1. Element scarcity - EUCHEMS Periodic table, 3<sup>rd</sup> edition, 2023.

These choices were subsequently made official (resolution 2022/11) during the EUCHEMS general assembly held, eventually in person, on 27 August 2022 on the occasion of the ECC-8 conference (8<sup>th</sup> EUCHEMS Chemistry Congress) in Lisbon, Portugal, between 28 August and 1 September 2022.

#### 4. Evaluation of the participation in terms of benefits and membership cost

With respect to the participation of the National Research Council in EUCHEMS, also considering that the necessary investment is rather modest, I feel obliged to underline the liaison role that EUCHEMS plays towards all European chemical societies as well as the CNR – DSCTM policy for which it is considered strategic to set up a strong synergy with the Italian Chemical Society (SCI), full member in EUCHEMS. The excellent relationships existing between CNR and SCI, which foresees the participation of numerous CNR researchers in important roles of the Society, make even more important the strategic choice of CNR to ensure its strong participation in EUCHEMS.

#### 5. Evaluation of Italians' attendance and how to improve interest and involvement

My general evaluation of the participation of the CNR in the different EUCHEMS activities is certainly positive and, as explained above, assumes a strategic value for the chemistry of the CNR with a strong synergistic value to the activities of SCI aimed at establishing a strong front of Italian chemistry towards the structures of international representation (EUCHEMS in Europe and IUPAC at international level).

#### 6. Italian experts with important roles within the Union or within related Commissions and Programs (if known)

Over the past year, Italy has still maintained an important presence in terms of quality and quantity within the European Chemical Society. Thus, 2022 was a decidedly positive year given that during the General Assembly in Lisbon one of our representatives, Prof. Angela Agostiano, was unanimously elected President of EUCHEMS, reviving our country's tradition of excellence which already had a respected President in Giovanni Natile during the five-year period 2004 - 2009. Prof. Agostiano, professor of chemistry at the University of Bari and former President of the Italian Chemical Society (2017 - 2019) has also held important roles in the

CNR, being for several years she was responsible for the Bari branch of the Institute for Chemical-Physical Processes (IPCF – CNR). By statute Agostiano will assume the role of EUCHEMS President starting from January 1<sup>st</sup>, 2024 and will remain in office for the three-year period 2024 - 2026.

Currently Dr. Nicola Armaroli, Research Director of the Institute for Organic Synthesis and Photoreactivity (ISOF – CNR) of Bologna, holds a top role within the Association being an elected member of the Executive Board of EUCHEMS where he is particularly active in the area of chemical technologies applied to energy and energy transition. In this context, Armaroli continues to play the role of Chairperson in the EuChemS Periodic Table Task group established in 2020.

Moreover, there are numerous Italian scientists participating in the various Divisions and Working Groups of EUCHEMS. Among these I mention: Luigia Sabbatini (UNI Bari), Luigi Mondello (UNI Messina) and Federico Marini (UNI Rome) for the Analytical Chemistry Division; Maurizio Peruzzini (CNR Florence), Nicola Armaroli (CNR Bologna), Tomaso Munari (CNCF), Sandra Rondinini (UNI Milan) for the Chemistry and Energy Division; Antonella Rossi (UNI Cagliari), Liberato Cardellini (UNI Ancona) for the Chemical Education Division; Antonio Marcomini (UNI Venezia) for the Environmental Chemistry Division; Francesco Peri (UNI Milano Bicocca) and Gabriele Costantino (UNI Parma) for the Division of Chemistry and Life Sciences; Michele Pavone (UNI Napoli) and Marco De Vivo (IIT) for the Division of Computational and Theoretical Chemistry); Marco Arlorio (UNI Alessandria), Gianni Galaverna (UNI Parma) for the Food Chemistry Division; Luigi Vaccaro (UNI Perugia) for the Green and Sustainable Chemistry Division; Roberto Gobetto (UNI Turin) for the Inorganic Chemistry Division; Flavia Groppi (UNI Milan) for the Division of Nuclear Chemistry and Radiochemistry; Andrea Pace (UNI Palermo) for the Organic Chemistry Division; Alceo Macchioni (UNI Perugia) for the Organometallic Chemistry Division; Giovanni Marletta (UNI Catania) for the Physical Chemistry Division; Salvatore Coluccia (UNI Turin) for the Solid State and Materials Chemistry Division; Luigi Campanella (UNI Rome) for the Working Party on Ethics in Chemistry; Marco Taddia (UNI Bologna) and Vincenzo Schettino (UNI Florence) for the Working Party on the History of Chemistry.

#### **7. If Union with CNR Commission, short summary about the 2022 CNR Commission activities**

Not applicable.

#### **8. Notes (if any)**

Not necessary.

#### **9. Conclusions**

Based on the considerations illustrated above, it is believed with full conviction that the participation of the CNR in EUCHEMS is highly positive. Therefore, it is recommended that our institution's membership in this important international organization be maintained.

Sesto Fiorentino, September 13<sup>th</sup>, 2023

Dr. Maurizio Peruzzini