

COST Action

Progress Report at 24 months

(02/10/2019 to 02/10/2021)

CA18202: Network for Equilibria and Chemical Thermodynamics Advanced Research

The Action was approved by the Committee of Senior Officials (CSO) on 4-6-2019 and has the MoU reference COST 019/19.

This report shows the data entered into e-COST to enable the Action Chair to verify the completeness and accuracy of the report with the MC prior to submitting the report via e-COST in fulfilment of the rules for COST Action Management, Monitoring and Final Assessment.

Action leadership and participants

Leadership positions

Position	Name	Contact details	Country*
Chair	Prof Demetrio Milea	dmilea@unime.it +390906765758	Italy

Position	Name	Contact details	Country*
Vice Chair	Dr Sofia Gama	sofia.gama@uwb.edu.pl +48857388090	Poland

Working groups

#	WG Title	# of participants	WG Leader	Country*
1	NECTAR for highly hydrolysable (HHC) and/or low-valence state (LVC) cations.	20	Dr Olga Iranzo olga.iranzo@univ-amu.fr	France
2	NECTAR for strong and/or multifunctional ligands, macromolecules, polyelectrolytes.	20	Prof M. Amelia Santos masantos@tecnico.ulisboa.pt	Portugal
3	NECTAR for multicomponent solutions and complex matrices.	20	Prof Arūnas Ramanavičius arunas.ramanavicius@chf.vu.lt	Lithuania
4	NECTAR tools, services and facilities.	20	Prof Winfried Plass sekr.plass@uni-jena.de	Germany
5	NECTAR for the future: new trends and exploitation of results.	40	Dr Natalia Busto nbusto@ubu.es	Spain

Other key leadership positions

Position	Name	Contact details	Country*
Science Communication Coordinator	Prof Elzbieta Gumienna-Kontecka	elzbieta.gumienna-kontecka@chem.uni.wroc.pl	Poland
GH Scientific Representative	Prof Demetrio Milea	dmilea@unime.it	Italy

* The country displayed is:

- for the Action Chair, the country that nominated that person to the Management Committee before they were elected Action Chair;
- for the Vice Chair the country that nominated the person as a Management Committee Member,
- for all other leadership positions, if the person is a MC Member the country displayed is the country of nomination, otherwise it is the country of the person's primary work affiliation.

Participants

COST members having accepted the MoU

AL	31/03/2021	AT	28/04/2020	BE	10/09/2019	BA	10/07/2020	BG	28/11/2019
HR	18/07/2019	CY	02/11/2021	CZ	10/07/2019	DK	04/09/2019	EE	26/04/2020
FI	15/04/2020	FR	25/06/2019	DE	02/07/2019	EL	07/04/2020	HU	02/07/2019
IS	27/06/2019	IE	18/02/2020	IL	02/11/2021	IT	27/06/2019	LV	02/11/2021
LT	24/07/2019	LU	02/11/2021	MT	27/06/2019	MD	13/08/2019	ME	02/11/2021
NL	02/11/2021	MK	17/09/2019	NO	02/11/2021	PL	25/06/2019	PT	03/07/2019
RO	04/10/2019	RS	12/07/2019	SK	25/10/2019	SI	01/07/2019	ZA	02/11/2021
ES	22/07/2019	SE	02/11/2021	CH	25/06/2019	TR	26/06/2019	UK	17/05/2021

Other participants

Institution Name	Country
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Summary

The main aim and objective of the Action is to

provide a scientific and technological platform to gather together, under a unique network, a critical mass of European research groups with a strong expertise in chemical equilibria with industrial stakeholders, with the valuable reinforcement of international partners and European enterprises.

During its first two years the Action progressed the achievement of this as described below

NECTAR Action is in good health. Despite pandemics, more than half of the deliverables have already been delivered, including some expected for next GPs. Furthermore, WGs meet regularly at least once per month, since collaborations and activities are well established. As a consequence of so frequent meetings, not all reports need to be produced. Gender balance is maintained (slightly in favour of females), and ECIs involvement is well established. Dissemination and communication activities are regular through website and social media, and a consistent number of papers has been published and joint projects submitted/funded. Networking activities are regularly exploited, with particular emphasis to meetings, STSMs and TS, the latter been a great success. Other outputs are expected during the second half of Action, generating high impact among stakeholders and general public.

The Action will implement the following measures in the coming two years to overcome any issues identified in this report as potentially endangering the achievement of the objectives of the Action

NECTAR will encourage active participation of its members in the decisional process, and involving more directly CG.

NECTAR will pay attention in accepting new membership requests, trying to involve only member countries and MC members only concretely interested in Action Activities.

Action website

<http://www.cost-nectar.eu>

Achievement of MoU objectives, deliverables and additional outputs/ achievements

MoU objectives

Please self-assess and describe the level of achievement of each MoU objective. For any MoU objective that is 25% or less achieved, please add an explanation.

Mou objective	Give response to actual scientific and technological challenges. In the wide field of equilibrium thermodynamics, particular attention will be paid to four specific areas: i) biology and medicine; ii) environmental science; iii) technology and industry; iv) modelling and software development.
Type of objective	1.a Development of a common understanding/definition of the subject matter 1.b Coordination of information seeking, identification, collection and/or data curation 2.a Building a community around a topic of scientific and/or socio-economic relevance, allowing for knowledge exchange and the development of a joint research agenda
Level of progress	51 - 75%
Description of progress with achieving the MoU objective	<p>Within this objective, during GP1 we identified 3 GP1 Goals (GP1G 3-5: Identify and involve new stakeholders, Getting first results from WGs activities, Start the training of the "Thermodynamic Minds") and 7 GP2G (GP2G 3-9: Identify and involve new stakeholders; Compilation and critical assessment of hydrolysis constants and solubility products for some selected elements, WG1; Development and testing of recommended procedures for the accurate determination of stability constants for some selected systems, WG2; Development of methodologies for determination of constants characterizing weak interactions of components involved in the equilibria and for investigations of equilibria in non-aqueous solvents, WGs 2, 3 and 4; Investigation of multicomponent systems including non-covalent, ion-ion and ion-solvent interactions, ternary systems, and mixed solvents and ionic liquids, WG3; Participating and co-Organizing high-level meetings and TSs on thermodynamic data analysis and correct use of experimental techniques for thermodynamic data determination, WGs 4 and 5; Compilation of first data collections and guidelines according to WGs results, WG4 and 5).</p> <p>This was achieved through the following Networking Tools (NT): Meetings (the organization of the 1st Nectar Conference during GP1, and the NECTAR Spring 2021 web meeting, the NECTAR MC Virtual Meeting and the 2nd European NECTAR Conference during GP2); 1 TS (SOLvE - 1st ISMEC-NECTAR Training School on the Determination, Analysis and Use of Thermodynamic Data); 20 STSMs.</p> <p>Concerning Dissemination, we setup the Action website (www.cost-nectar.eu), and we created dedicated accounts on main social media (Facebook, Instagram, Twitter, LinkedIn and Researchgate), and we published at least 38 papers coming from collaborations among NECTAR members (6 with 3-more countries, 32 from 2 countries).</p> <p>This objective is the widest of the Action, and it is hard to give a "level" of achievement, considering that effects will last even beyond the end of the Action. Nevertheless it is possible to undoubtedly state that more than 50% of work has already been done.</p>
Mou objective	Develop new technologies. The multidisciplinary and diversity of expertise within NECTAR will bring about a demand for developing new technological solutions, which will successfully combine all stakeholders' interests.
Type of objective	1.e Development of knowledge needing international coordination, pertaining to a new or improved theory, model, methodology, technology or technique 1.f Achievement of a specific tangible output that cannot be achieved without

	<p>international coordination (e.g. due to practical issues such as database availability, language barriers, availability of infrastructure or know-how, etc.)</p> <p>1.g Input to stakeholders (e.g. standardization body, policy-makers, regulators, users), excluding commercial applications</p>
Level of progress	51 - 75%
Description of progress with achieving the MoU objective	<p>Within this objective, during GP1 we identified 3 GP1 Goals (GP1G 3-5: Identify and involve new stakeholders, Getting first results from WGs activities, Start the training of the “Thermodynamic Minds”) and 6 GP2G (GP2G 3,5-9: Identify and involve new stakeholders; Development and testing of recommended procedures for the accurate determination of stability constants for some selected systems, WG2; Development of methodologies for determination of constants characterizing weak interactions of components involved in the equilibria and for investigations of equilibria in non-aqueous solvents, WGs 2, 3 and 4; Investigation of multicomponent systems including non-covalent, ion-ion and ion-solvent interactions, ternary systems, and mixed solvents and ionic liquids, WG3; Participating and co-Organizing high-level meetings and TSs on thermodynamic data analysis and correct use of experimental techniques for thermodynamic data determination, WGs 4 and 5; Compilation of first data collections and guidelines according to WGs results, WG4 and 5).</p> <p>This was achieved through the following Networking Tools (NT): Meetings (the organization of the 1st Nectar Conference during GP1, and the NECTAR Spring 2021 web meeting, the NECTAR MC Virtual Meeting and the 2nd European NECTAR Conference during GP2); 1 TS (SOLvE - 1st ISMEC-NECTAR Training School on the Determination, Analysis and Use of Thermodynamic Data); 20 STSMs.</p> <p>Concerning Dissemination, we setup the Action website (www.cost-nectar.eu), and we created dedicated accounts on main social media (Facebook, Instagram, Twitter, LinkedIn and Researchgate), and we published at least 38 papers coming from collaborations among NECTAR members (6 with 3-more countries, 32 from 2 countries).</p> <p>Within this objective, according to GPGs, WGs developed and are testing recommended procedures for the accurate determination of stability constants for some selected systems; developed new methodologies for determination of constants characterizing weak interactions of components involved in the equilibria and for investigations of equilibria in non-aqueous solvents; investigated multicomponent systems involving non-covalent, ion-ion and ion-solvent interactions, ternary systems, and mixed solvents and ionic liquids; participated and co-organized a TSs on thermodynamic data analysis and correct use of experimental techniques for thermodynamic data determination, and compiled first data collections and guidelines.</p>
Mou objective	Identify new industrial stakeholders and applications. One of NECTAR’s aims is to enlarge the perception about the potential of the use of different thermodynamic studies on specific industrial and technological applications (including environmental and biological/medical).
Type of objective	<p>1.g Input to stakeholders (e.g. standardization body, policy-makers, regulators, users), excluding commercial applications</p> <p>1.h Input for future market applications (including cooperation with private enterprises)</p>
Level of progress	26 - 50%
Description of progress with achieving the MoU objective	<p>Within this objective, during GP1 we identified 4 GP1 Goals (GP1G 1-3, 5: Promote and advertise Action and Action’s aims, Consolidate (and expand) the existing Network, Identify and involve new stakeholders, Start the training of the “Thermodynamic Minds”) and 6 GP2G (GP2G 1-3,5-9: Promote and advertise Action and Action’s aims, Consolidate (and expand) the existing Network, Identify and involve new stakeholders; Development and testing of recommended procedures for the accurate determination of stability constants for some selected systems, WG2; Development of methodologies for determination of constants characterizing weak interactions of components involved in the equilibria and for investigations of equilibria in non-aqueous solvents, WGs 2, 3 and</p>

	<p>4; Investigation of multicomponent systems including non-covalent, ion-ion and ion-solvent interactions, ternary systems, and mixed solvents and ionic liquids, WG3; Participating and co-Organizing high-level meetings and TSs on thermodynamic data analysis and correct use of experimental techniques for thermodynamic data determination, WGs 4 and 5; Compilation of first data collections and guidelines according to WGs results, WG4 and 5).</p> <p>This was achieved through the following Networking Tools (NT): Meetings (the organization of the 1st Nectar Conference during GP1, and the NECTAR Spring 2021 web meeting, the NECTAR MC Virtual Meeting and the 2nd European NECTAR Conference during GP2); 1 TS (SOLvE - 1st ISMEC-NECTAR Training School on the Determination, Analysis and Use of Thermodynamic Data); 20 STSMs.</p> <p>Concerning Dissemination, we setup the Action website (www.cost-nectar.eu), and we created dedicated accounts on main social media (Facebook, Instagram, Twitter, LinkedIn and Researchgate), and we published at least 38 papers coming from collaborations among NECTAR members (6 with 3-more countries, 32 from 2 countries).</p> <p>Within this objective, we have been able to involve in the Action four industrial partners (one from a NNC), consolidated a partnership with another organization working in the field (the International group for the Thermodynamics of Complexes, the ISMEC Group, www.ismecgroup.org), and through the meetings, website and social media we disseminated our results and we gave awareness of the importance of chemical thermodynamics for the development of new, and improvement of existing, industrial/technological applications.</p> <p>Level reached is 50%</p>
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Mou objective	Promoting mobility and multidisciplinary training between the different participants of the Action.
Type of objective	<p>2.a Building a community around a topic of scientific and/or socio-economic relevance, allowing for knowledge exchange and the development of a joint research agenda</p> <p>2.b Building a community around a new or emerging field of research</p> <p>2.c Bridging separate fields of science/disciplines to achieve breakthroughs that require an interdisciplinary approach</p>
Level of progress	51 - 75%
Description of progress with achieving the MoU objective	<p>Within this objective, during GP1 we identified 2 GP1 Goals (GP1G 4 and 5: Getting first results from WGs activities, Start the training of the “Thermodynamic Minds”) and 2 GP2G (GP2G 7 and 8: Investigation of multicomponent systems including non-covalent, ion-ion and ion-solvent interactions, ternary systems, and mixed solvents and ionic liquids, WG3; Participating and co-Organizing high-level meetings and TSs on thermodynamic data analysis and correct use of experimental techniques for thermodynamic data determination, WGs 4 and 5).</p> <p>This was achieved through the following Networking Tools (NT): Meetings (the organization of the 1st Nectar Conference during GP1, and the NECTAR Spring 2021 web meeting, the NECTAR MC Virtual Meeting and the 2nd European NECTAR Conference during GP2); 1 TS (SOLvE - 1st ISMEC-NECTAR Training School on the Determination, Analysis and Use of Thermodynamic Data); 20 STSMs.</p> <p>Concerning Dissemination, we setup the Action website (www.cost-nectar.eu), and we created dedicated accounts on main social media (Facebook, Instagram, Twitter, LinkedIn and Researchgate), and we published at least 38 papers coming from collaborations among NECTAR members (6 with 3-more countries, 32 from 2 countries).</p> <p>Within this objective, we promoted 20 STSMs, focusing on the complementarity of research performed between the hosting group and the trainees, as well as a TS. Even</p>

	<p>organized meetings were particularly focused (with dedicated sessions) to ECIs. All these tools were a great success, and they will be promoted again during next periods.</p> <p>Only ITC Grants were not fully exploited, due to the great uncertainty caused by pandemics, since most of the meetings were online and/or postponed.</p>
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Mou objective	Transferring knowledge and promoting industrial awareness.
Type of objective	<p>1.h Input for future market applications (including cooperation with private enterprises)</p> <p>1.i Dissemination of research results to the general public</p> <p>1.j Dissemination of research results to stakeholders (excluding specific input in view of knowledge application)</p>
Level of progress	51 - 75%
Description of progress with achieving the MoU objective	<p>Within this objective, during GP1 we identified 2 GP1 Goals (GP1G 1 and 5: Promote and advertise Action and Action's aims, Start the training of the "Thermodynamic Minds") and 8 GP2G (GP2G 1, 3-9: Promote and advertise Action and Action's aims, Identify and involve new stakeholders; Compilation and critical assessment of hydrolysis constants and solubility products for some selected elements, WG1; Development and testing of recommended procedures for the accurate determination of stability constants for some selected systems, WG2; Development of methodologies for determination of constants characterizing weak interactions of components involved in the equilibria and for investigations of equilibria in non-aqueous solvents, WGs 2, 3 and 4; Investigation of multicomponent systems including non-covalent, ion-ion and ion-solvent interactions, ternary systems, and mixed solvents and ionic liquids, WG3; Participating and co-Organizing high-level meetings and TSs on thermodynamic data analysis and correct use of experimental techniques for thermodynamic data determination, WGs 4 and 5; Compilation of first data collections and guidelines according to WGs results, WG4 and 5).</p> <p>This was achieved through the following Networking Tools (NT): Meetings (the organization of the 1st Nectar Conference during GP1, and the NECTAR Spring 2021 web meeting, the NECTAR MC Virtual Meeting and the 2nd European NECTAR Conference during GP2); 1 TS (SOLvE - 1st ISMEC-NECTAR Training School on the Determination, Analysis and Use of Thermodynamic Data); 20 STSMs.</p> <p>Concerning Dissemination, we setup the Action website (www.cost-nectar.eu), and we created dedicated accounts on main social media (Facebook, Instagram, Twitter, LinkedIn and Researchgate), and we published at least 38 papers coming from collaborations among NECTAR members (6 with 3-more countries, 32 from 2 countries).</p> <p>Within this objective, we have been able to involve in the Action four industrial partners (one from a NNC), consolidated a partnership with another organization working in the field (the International group for the Thermodynamics of Complexes, the ISMEC Group, www.ismecgroup.org), and through the meetings, website and social media we disseminated our results and we gave awareness of the importance of chemical thermodynamics for the development of new, and improvement of existing, industrial/technological applications.</p> <p>Level reached is 55%</p>

Mou objective	Supporting a high proportion of ECIs, ITCs and assuring gender balance in the COST Action
Type of objective	2.e Building capacity in the demographic inclusiveness of networks in science and technology, including representation of newly established research groups, Early-Career Investigators, the under-represented gender and teams from countries/regions with less capacity in the field of the Action
Level of progress	76 - 100%

<p>Description of progress with achieving the MoU objective</p>	<p>Within this objective, during GP1 we identified 3 GP1 Goals (GP1G 2, 3 and 5: Consolidate (and expand) the existing Network, Identify and involve new stakeholders, Start the training of the “Thermodynamic Minds”) and 3 GP2G (GP2G 2, 3 and 8: Consolidate (and expand) the existing Network, Identify and involve new stakeholders; Participating and co-Organizing high-level meetings and TSs on thermodynamic data analysis and correct use of experimental techniques for thermodynamic data determination, WGs 4 and 5).</p> <p>This was achieved through the following Networking Tools (NT): Meetings (the organization of the 1st Nectar Conference during GP1, and the NECTAR Spring 2021 web meeting, the NECTAR MC Virtual Meeting and the 2nd European NECTAR Conference during GP2); 1 TS (SOLvE - 1st ISMEC-NECTAR Training School on the Determination, Analysis and Use of Thermodynamic Data); 20 STSMs.</p> <p>Concerning Dissemination, we setup the Action website (www.cost-nectar.eu), and we created dedicated accounts on main social media (Facebook, Instagram, Twitter, LinkedIn and Researchgate), and we published at least 38 papers coming from collaborations among NECTAR members (6 with 3-more countries, 32 from 2 countries).</p> <p>Within this objective, we have a slight favourable unbalance towards female participants, we have a high proportion of ECIs, some of them occupying managing positions, and an excess of ITCs (18 of 31). The presence meetings have all been organized in ITC, while almost all STSMs were involving ECIs and ITC.</p> <p>Level reached is 80%</p>
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<p>Mou objective</p>	<p>Promoting the sustainability of the network beyond the Action.</p>
<p>Type of objective</p>	<p>1.g Input to stakeholders (e.g. standardization body, policy-makers, regulators, users), excluding commercial applications</p> <p>1.h Input for future market applications (including cooperation with private enterprises)</p> <p>1.j Dissemination of research results to stakeholders (excluding specific input in view of knowledge application)</p>
<p>Level of progress</p>	<p>51 - 75%</p>
<p>Description of progress with achieving the MoU objective</p>	<p>Within this objective, during GP1 we identified 1 GP1 Goal (GP1G 5: Start the training of the “Thermodynamic Minds”) and 8 GP2G (GP2G 1, 2, 4-9: Promote and advertise Action and Action’s aims, Consolidate (and expand) the existing Network, Compilation and critical assessment of hydrolysis constants and solubility products for some selected elements, WG1; Development and testing of recommended procedures for the accurate determination of stability constants for some selected systems, WG2; Development of methodologies for determination of constants characterizing weak interactions of components involved in the equilibria and for investigations of equilibria in non-aqueous solvents, WGs 2, 3 and 4; Investigation of multicomponent systems including non-covalent, ion-ion and ion-solvent interactions, ternary systems, and mixed solvents and ionic liquids, WG3; Participating and co-Organizing high-level meetings and TSs on thermodynamic data analysis and correct use of experimental techniques for thermodynamic data determination, WGs 4 and 5; Compilation of first data collections and guidelines according to WGs results, WG4 and 5).</p> <p>This was achieved through the following Networking Tools (NT): Meetings (the organization of the 1st Nectar Conference during GP1, and the NECTAR Spring 2021 web meeting, the NECTAR MC Virtual Meeting and the 2nd European NECTAR Conference during GP2); 1 TS (SOLvE - 1st ISMEC-NECTAR Training School on the Determination, Analysis and Use of Thermodynamic Data); 20 STSMs.</p> <p>Concerning Dissemination, we setup the Action website (www.cost-nectar.eu), and we created dedicated accounts on main social media (Facebook, Instagram, Twitter, LinkedIn and Researchgate), and we published at least 38 papers coming from collaborations among NECTAR members (6 with 3-more countries, 32 from 2</p>

countries).

Within this objective, fundamental is the "Training of the Thermodynamic Minds". This was achieved through the meetings, the STSMs and the TS. Another important aspect is the consolidation and expansion of the network, which will allow future actions and joint projects. Finally, results achieved by WGs will be fundamental for the general public and stakeholders, favouring the creation of new cooperations within and outside the NECTAR community.

Deliverables

This section covers only deliverables that were foreseen for the Action, not additional outputs that were generated during the Action (these additional outputs will be added in the following section). Please select and comment on the progress with achieving each deliverable.

For deliverables that are:

- Delivered, please provide proof to enable the Action Rapporteur to confirm the delivery
- Not delivered but delivery is foreseen within 2 years please explain how the delivery will be achieved
- Not foreseen to be delivered please explain why not

Deliverable	Report of first (kick-off) MC meeting: the main decisions taken will be reported, including the coordination and strategy details of the Action, as well as guidelines related to the participation, open-access policy and associated funds, confidentiality, and intellectual property.		
Progress with achieving deliverable	Delivered	Month deliverable due	1
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Action's webpage and general and professional social media: after Action's official start, an official webpage will be setup, reporting all the relevant information, including a mailing list of all participants. Accounts/groups will be also created in general and professional social media to give more visibility to Action and Action's results.		
Progress with achieving deliverable	Delivered	Month deliverable due	1
Proof of progress with achieving the deliverable	https://cost-nectar.eu/		

Deliverable	Report of the first Working Groups (WGs) meetings: the main decisions taken by each WG will be reported, with particular reference to working plans and coordination of WG activities.		
Progress with achieving deliverable	Delivered	Month deliverable due	3
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Report of the first Core Group (CG) meeting: the main decisions taken will be reported, as well as a detailed description of technical, scientific and general activities of WGs, together with proposals for Action's implementation.		
Progress with achieving deliverable	Delivered	Month deliverable due	6
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	First annual WGs Report: WGs achievements, activities and results obtained will be reported, as well as the working plan for the following year.		
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Progress with achieving deliverable	Delivered	Month deliverable due	11
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Report of the second CG meeting: the main decisions taken will be reported, as well as a detailed description of technical, scientific and general activities of WGs, together with proposals for Action's implementation.		
Progress with achieving deliverable	Delivered	Month deliverable due	12
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	First MC Progress Report: the main Action's activities and achievements will be reported, as well as the development plan for the following year. Particular attention will be paid to assess Action progress and eventual drawbacks, and taking corrective and incentive measures to ensure its success.		
Progress with achieving deliverable	Delivered	Month deliverable due	12
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Report of the second Working Groups (WGs) meetings: the main decisions taken by each WG will be reported, with particular reference to main WGs achievements, working plans and coordination of WG activities.		
Progress with achieving deliverable	Delivered	Month deliverable due	15
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Report of the third CG meeting: the main decisions taken will be reported, as well as a detailed description of technical, scientific and general activities of WGs, together with proposals for Action's implementation.		
Progress with achieving deliverable	Delivered	Month deliverable due	18
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Proceedings of the first Action's International Conference: the proceedings of the scientific contributions of Conference participants will be published, together with a report of the main conference facts.		
Progress with achieving deliverable	Delivered	Month deliverable due	21
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/1st_am.html		

Deliverable	Second annual WGs Reports: WGs achievements, activities and results obtained will be		
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	reported by each WG, as well as the working plan for the following year.		
Progress with achieving deliverable	Delivered	Month deliverable due	23
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Report of the fourth CG meeting: the main decisions taken will be reported, as well as a detailed description of technical, scientific and general activities of WGs, together with proposals for Action's implementation.		
Progress with achieving deliverable	Delivered	Month deliverable due	24
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Second MC Progress Report: the main Action's activities and achievements will be reported, as well as the development plan for the following year. Particular attention will be paid to assess Action progress and eventual drawbacks, and taking corrective and incentive measures to ensure its success.		
Progress with achieving deliverable	Delivered	Month deliverable due	24
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/2nd_am.html		

Deliverable	Report of the third Working Groups (WGs) meetings: the main decisions taken by each WG will be reported, with particular reference to main WGs achievements, working plans and coordination of WG activities.		
Progress with achieving deliverable	Delivered	Month deliverable due	27
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/meetings.html		

Deliverable	Report of the fifth CG meeting: the main decisions taken will be reported, as well as a detailed description of technical, scientific and general activities of WGs, together with proposals for Action's implementation.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	30
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Third annual WGs Reports: WGs achievements, activities and results obtained will be reported by each WG, as well as the working plan for the following year.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	35
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Report of the sixth CG meeting: the main decisions taken will be reported, as well as a detailed description of technical, scientific and general activities of WGs, together with		
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	proposals for Action's implementation.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	36
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Third MC Progress Report: the main Action's activities and achievements will be reported, as well as the development plan for the following year. Particular attention will be paid to assess Action progress and eventual drawbacks, and taking corrective and incentive measures to ensure its success.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	36
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Report of the fourth and final Working Groups (WGs) meetings: the main decisions taken by each WG will be reported, with particular reference to main WGs achievements, working plans and coordination of WG activities for finalising WGs running work.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	39
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Report of the seventh CG meeting: the main decisions taken will be reported, as well as a detailed description of technical, scientific and general activities of WGs, together with proposals for Action's implementation.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	42
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Proceedings of the second Action's International Conference: the proceedings of the scientific contributions of Conference participants will be published, together with a report of the main conference facts.		
Progress with achieving deliverable	Delivered	Month deliverable due	45
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/2nd_am.html		

Deliverable	Distribution/Publication of supporting material for Training Schools (TSs): diverse documentation (papers, protocols, methods guidelines) will be compiled and distributed for support of the students activities during the four TSs that would take place in the second semester of each year of the Action.		
Progress with achieving deliverable	Delivered	Month deliverable due	45
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/1st_ts.html		

Deliverable	WGs Final Reports: WGs achievements, activities and results obtained during the entire Action will be reported by each WG		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	47
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Elaboration and publication of workflows, new protocols and guidelines: during the whole Action, at least 8 new protocols and guidelines will be published, concerning the setup of new experimental and data treatment procedures, the use of coupled experimental techniques and related data treatment.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	48
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Publication of high-level scientific research articles/reviews in peer-reviewed scientific journals: during the whole Action, at least 10 papers per year, resulting from the collaboration between Action's participants, will be published on Action's relevant topics.		
Progress with achieving deliverable	Delivered	Month deliverable due	48
Proof of progress with achieving the deliverable	https://cost-nectar.eu/pages/publications.html		

Deliverable	Patents: at least three patents on the foreground related to the Action activities are expected in Action's timeframe.		
Progress with achieving deliverable	Not delivered, but expected within 2 years after the end of the Action	Month deliverable due	48
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4) and it is expected after the end of the Action		

Deliverable	Software and Databases: in the timeframe of the Action, an updated stability constants (and other thermodynamic parameters) database will be released, as well as new software for data acquisition and elaboration.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	48
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Report of the eight and final CG meeting: the main decisions taken will be reported, as well as a detailed description and summary of technical, scientific and general activities of WGs during the whole Action.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	48
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Deliverable	Final Report: the main achievements of Action will be reported together with a summary of main Action activities. New perspectives will be also reported.		
Progress with achieving deliverable	Not delivered, but expected before end of Action	Month deliverable due	48
Explanation	The deliverable is scheduled for next Grant Periods (GP3 and GP4)		

Additional outputs / achievements

Co-authored Action publications

Please enter below **ONLY** publications (including publications that are submitted but not yet accepted):

- that are on the topic of the Action, and
- that are co-authored by at least two Action participants from two countries participating in the Action, and
- for which the Action networking was necessary.

Please pay special attention to the COST Excellence and Inclusiveness policy and ensure the inclusion of publications with authors from COST Inclusiveness Target Countries (ITCs), from the underrepresented gender in the Action and from Early Career Investigators/Young researchers.

	Bibliographic data	Countries participating in the Action among authors	Open Access	COST cited?	COST funds?	Relevance to H2020 Societal challenge	Peer Reviewed?
1	<p>doi:10.1002/chem.202003842</p> <p>Title Iron Coordination Properties of Gramicidin as Model for the New Class of Diazepamdiolate Based Siderophores</p> <p>Authors Sofia Gama; Ron Hermenau; Mariachiara Frontauria; Demetrio Milea; Silvio Sammartano; Christian Hertweck; Winfried Plass</p> <p>DOI doi:10.1002/chem.202003842</p> <p>Type Journal article</p> <p>Published in Chemistry – A European Journal</p> <p>Published by Wiley</p> <p>ISSNs 0947-6539; 1521-3765</p> <p>Subjects General Chemistry; Catalysis; Organic Chemistry</p> <p>Links https://onlinelibrary.wiley.com/doi/pdf/10.1002/chem.202003842; https://onlinelibrary.wiley.com/doi/full-xml/10.1002/chem.202003842</p>	DE, IT, PL	Y	Y	N	Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy	Y
2	<p>doi:10.1021/acs.inorgchem.1c01275</p> <p>Title Triapine Analogues and Their Copper(II) Complexes: Synthesis, Characterization,</p>	AT, HU, RS, SK	N	Y	N	Health, demographic change and wellbeing	Y

	<p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSNs</p> <p>Subjects</p> <p>Link</p>	<p>Solution Speciation, Redox Activity, Cytotoxicity, and mR2 RNR Inhibition Iuliana Besleaga; Iryna Stepanenko; Tatsiana V. Petrasheuskaya; Denisa Darvasiova; Martin Breza; Marta Hammerstad; Małgorzata A. Marć; Alexander Prado-Roller; Gabriella Spengler; Ana Popović-Bijelić; Eva A. Enyedy; Peter Rapta; Anatoly D. Shutalev; Vladimir B. Arion doi:10.1021/acs.inorgchem.1c01275</p> <p>Journal article</p> <p>Inorganic Chemistry</p> <p>American Chemical Society (ACS)</p> <p>0020-1669; 1520-510X</p> <p>Inorganic Chemistry; Physical and Theoretical Chemistry</p> <p>https://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.1c01275</p>						
3	<p>doi:10.1039/D1OB01015H</p> <p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSNs</p> <p>Subjects</p> <p>Link</p>	<p>Synthesis, characterization, and cellular investigations of porphyrin– and chlorin–indomethacin conjugates for photodynamic therapy of cancer José Almeida; Guanyu Zhang; Maodie Wang; Carla Queirós; Ana F. R. Cerqueira; Augusto C. Tomé; Giampaolo Barone; M. Graça H. Vicente; Evamarie Hey-Hawkins; Ana M. G. Silva; Maria Rangel doi:10.1039/D1OB01015H</p> <p>Journal article</p> <p>Organic & Biomolecular Chemistry</p> <p>Royal Society of Chemistry (RSC)</p> <p>1477-0520; 1477-0539</p> <p>Organic Chemistry; Physical and Theoretical Chemistry; Biochemistry</p> <p>http://pubs.rsc.org/en/content/articlepdf/2021/OB/D1OB01015H</p>	DE, IT, PT	N	Y	N	Health, demographic change and wellbeing	Y
4	<p>doi:10.3390/biom10091336</p>		AT, HU, RS, SK	Y	Y	N	Health, demographic	Y

	<p>Title Authors DOI Type Published in Published by ISSN Subjects Link</p>	<p>Triapine Derivatives Act as Copper Delivery Vehicles to Induce Deadly Metal Overload in Cancer Cells Kateryna Ohui; Iryna Stepanenko; Iuliana Besleaga; Maria V. Babak; Radu Stafi; Denisa Darvasiova; Gerald Giester; Vivien Pósa; Eva A. Enyedy; Daniel Vegh; Peter Rapta; Wee Han Ang; Ana Popović-Bijelić; Vladimir B. Arion doi:10.3390/biom10091336 Journal article Biomolecules MDPI AG 2218-273X Molecular Biology; Biochemistry https://www.mdpi.com/2218-273X/10/9/1336/pdf</p>					change and wellbeing	
5	<p>doi:10.3390/biom10091213 Title Authors DOI Type Published in Published by ISSN Subjects Link</p>	<p>Insight into the Anticancer Activity of Copper(II) 5-Methylenetrimethylammonium-m-Thiosemicarbazones and Their Interaction with Organic Cation Transporters Miljan N. M. Milunović; Oleg Palamarciuc; Angela Sirbu; Sergiu Shova; Dan Dumitrescu; Dana Dvoranová; Peter Rapta; Tatsiana V. Petrasheuskaya; Eva A. Enyedy; Gabriella Spengler; Marija Ilic; Harald H. Sitte; Gert Lubec; Vladimir B. Arion doi:10.3390/biom10091213 Journal article Biomolecules MDPI AG 2218-273X Molecular Biology; Biochemistry https://www.mdpi.com/2218-273X/10/9/1213/pdf</p>	AT, HU, MD, RO, SK	Y	Y	N	Health, demographic change and wellbeing	Y
6	<p>doi:10.3390/biom10060930</p>		DE, IT, PL	Y	Y	N	Food security,	Y

	<p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSN</p> <p>Subjects</p> <p>Link</p>	<p>8-Hydroxyquinoline-2-Carboxylic Acid as Possible Molybdophore: A Multi-Technique Approach to Define Its Chemical Speciation, Coordination and Sequestering Ability in Aqueous Solution</p> <p>Katia Arena; Giuseppe Brancato; Francesco Cacciola; Francesco Crea; Salvatore Cataldo; Concetta De Stefano; Sofia Gama; Gabriele Lando; Demetrio Milea; Luigi Mondello; Alberto Pettignano; Winfried Plass; Silvio Sammartano</p> <p>doi:10.3390/biom10060930</p> <p>Journal article</p> <p>Biomolecules</p> <p>MDPI AG</p> <p>2218-273X</p> <p>Molecular Biology; Biochemistry</p> <p>https://www.mdpi.com/2218-273X/10/6/930/pdf</p>					<p>sustainable agriculture and forestry, marine and maritime and inland water reasearch, and the Bioeconomy</p>	
7	<p>doi:10.1016/j.jinorgbio.2020.111304</p> <p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSN</p> <p>Subjects</p> <p>Links</p>	<p>The N-terminal domain of Helicobacter pylori's Hpn protein: The role of multiple histidine residues</p> <p>Denise Bellotti; Angelica Sinigaglia; Remo Guerrini; Erika Marzola; Magdalena Rowińska-Żyrek; Maurizio Remelli</p> <p>doi:10.1016/j.jinorgbio.2020.111304</p> <p>Journal article</p> <p>Journal of Inorganic Biochemistry</p> <p>Elsevier BV</p> <p>0162-0134</p> <p>Inorganic Chemistry; Biochemistry</p> <p>https://api.elsevier.com/content/article/PII:S0162013420303329?httpAccept=text/xml;</p> <p>https://api.elsevier.com/content/article/PII:S0162013420303329?httpAccept=text/plain</p>	IT, PL	N	Y	N	<p>Health, demographic change and wellbeing</p>	Y
8	<p>doi:10.1002/anie.202015554</p>		IT, ES	N	Y	N	<p>Health, demographic</p>	Y

	<p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSNs</p> <p>Subjects</p> <p>Links</p>	<p>Single-Stranded DNA as Supramolecular Template for One-Dimensional Palladium(II) Arrays</p> <p>Antonio Pérez-Romero; Alicia Domínguez-Martín; Simona Galli; Noelia Santamaría-Díaz; Oscar Palacios; José A. Dobado; May Nyman; Miguel A. Galindo</p> <p>doi:10.1002/anie.202015554</p> <p>Journal article</p> <p>Angewandte Chemie International Edition</p> <p>Wiley</p> <p>1433-7851; 1521-3773</p> <p>General Chemistry; Catalysis</p> <p>https://onlinelibrary.wiley.com/doi/pdf/10.1002/anie.202015554;</p> <p>https://onlinelibrary.wiley.com/doi/full-xml/10.1002/anie.202015554</p>					change and wellbeing	
9	<p>doi:10.1016/j.saa.2021.119914</p> <p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSN</p> <p>Subjects</p> <p>Links</p>	<p>Combined spectroscopic and theoretical analysis of the binding of a water-soluble perylene diimide to DNA/RNA polynucleotides and G-quadruplexes</p> <p>Francesca Macij; Lorenzo Cupellini; Mariassunta Stifano; Javier Santolaya; Cristina Pérez-Arnaiz; Andrea Pucci; Giampaolo Barone; Begoña García; Natalia Busto; Tarita Biver</p> <p>doi:10.1016/j.saa.2021.119914</p> <p>Journal article</p> <p>Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy</p> <p>Elsevier BV</p> <p>1386-1425</p> <p>Spectroscopy; Instrumentation; Atomic and Molecular Physics, and Optics; Analytical Chemistry</p> <p>https://api.elsevier.com/content/article/PII:S138614252100490X?httpAccept=text/xml;</p> <p>https://api.elsevier.com/content/article/PII:</p>	IT, ES	N	Y	N	Health, demographic change and wellbeing	Y

		S138614252100490X?httpAccept=text/plain						
10	<p>doi:10.1016/j.cbi.2021.109522</p> <p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSN</p> <p>Subjects</p> <p>Links</p>	<p>Anticancer and antibacterial potential of robust Ruthenium(II) arene complexes regulated by choice of α-diimine and halide ligands</p> <p>Emanuele Zanda; Natalia Busto; Lorenzo Biancalana; Stefano Zacchini; Tarita Biver; Begoña Garcia; Fabio Marchetti</p> <p>doi:10.1016/j.cbi.2021.109522</p> <p>Journal article</p> <p>Chemico-Biological Interactions</p> <p>Elsevier BV</p> <p>0009-2797</p> <p>Toxicology; General Medicine</p> <p>https://api.elsevier.com/content/article/PII:S0009279721001587?httpAccept=text/xml;</p> <p>https://api.elsevier.com/content/article/PII:S0009279721001587?httpAccept=text/plain</p>	IT, ES	N	Y	N	Health, demographic change and wellbeing	Y
11	<p>doi:10.1016/j.molliq.2021.116353</p> <p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSN</p> <p>Subjects</p>	<p>Cation isomerism effect on micellization of pyridinium based surface-active ionic liquids</p> <p>Isidora Čobanov; Bojan Šarac; Žiga Medoš; Aleksandar Tot; Milan Vraneš; Slobodan Gadžurić; Marija Bešter-Rogač</p> <p>doi:10.1016/j.molliq.2021.116353</p> <p>Journal article</p> <p>Journal of Molecular Liquids</p> <p>Elsevier BV</p> <p>0167-7322</p> <p>Materials Chemistry; Physical and Theoretical Chemistry; Spectroscopy; Condensed Matter Physics; Atomic and Molecular Physics, and Optics; Electronic, Optical and Magnetic Materials</p>	RS, SI	N	Y	N	Climate action, environment, resource efficiency and raw materials	Y

	Links	https://api.elsevier.com/content/article/PII:S0167732221010771?httpAccept=text/xml ; https://api.elsevier.com/content/article/PII:S0167732221010771?httpAccept=text/plain						
12	doi:10.1016/j.molliq.2021.116673 Title Authors DOI Type Published in Published by ISSN Subjects Links	The nature of ions organisation in aqueous solutions of ionic liquids based on local anaesthetic drugs and salicylic acid Milan Vraneš; Jovana Panić; Slobodan Gadžurić; Marija Bešter-Rogač; Aleksandar Tot doi:10.1016/j.molliq.2021.116673 Journal article Journal of Molecular Liquids Elsevier BV 0167-7322 Materials Chemistry; Physical and Theoretical Chemistry; Spectroscopy; Condensed Matter Physics; Atomic and Molecular Physics, and Optics; Electronic, Optical and Magnetic Materials https://api.elsevier.com/content/article/PII:S0167732221013970?httpAccept=text/xml ; https://api.elsevier.com/content/article/PII:S0167732221013970?httpAccept=text/plain	RS, SI	N	Y	N	Climate action, environment, resource efficiency and raw materials	Y
13	doi:10.3390/ph14060518 Title Authors	Comparison of Solution Chemical Properties and Biological Activity of Ruthenium Complexes of Selected β -Diketone, 8-Hydroxyquinoline and Pyrithione Ligands Tamás Pivarcsik; Gábor Tóth; Nikoletta Szemerédi ; Anita Bogdanov ; Gabriella Spengler ; Jakob Kljun ; Jerneja Kladnik;	HU, SI	Y	Y	N	Health, demographic change and wellbeing	Y

	DOI Type Published in Published by ISSN Subjects Link	Iztok Turel ; Éva A. Enyedy doi:10.3390/ph14060518 Journal article Pharmaceuticals MDPI AG 1424-8247 Drug Discovery; Pharmaceutical Science; Molecular Medicine https://www.mdpi.com/1424-8247/14/6/518/pdf						
14	doi:10.1039/d0dt03332d Title Authors DOI Type Published in Published by ISSNs Subject Link	An in vitro selective inhibitory effect of silver(i) aminoacidates against bacteria and intestinal cell lines and elucidation of the mechanism of action by means of DNA binding properties, DNA cleavage and cell cycle arrest Michaela Rendošová; Róbert Gyepes ; Ivana Cingelová Maruščáková; Dagmar Mudroňová; Danica Sabolová; Martin Kello; Mária Vilková; Miroslav Almáši ; Veronika Huntošová; Ondřej Zemek; Zuzana Vargová doi:10.1039/d0dt03332d Journal article Dalton Transactions Royal Society of Chemistry (RSC) 1477-9226 ; 1477-9234 Inorganic Chemistry http://pubs.rsc.org/en/content/articlepdf/2021/DT/D0DT03332D	CZ, SK	N	Y	N	Health, demographic change and wellbeing	Y
15	doi:10.1016/j.jinorgbio.2020.111170 Title Authors	In vitro biological evaluation and consideration about structure-activity relationship of silver(I) aminoacidate complexes Gabriela Kuzderová; Michaela Rendošová; Róbert Gyepes; Miroslav Almáši; Danica Sabolová; Mária Vilková;	CZ, SK	N	Y	N	Health, demographic change and wellbeing	Y

	<p>DOI Type Published in Published by ISSN Subjects Links</p>	<p>Petra Olejníková; Daniela Hudecová; Martin Kello; Zuzana Vargová doi:10.1016/j.jinorgbio.2020.111170 Journal article Journal of Inorganic Biochemistry Elsevier BV 0162-0134 Inorganic Chemistry; Biochemistry https://api.elsevier.com/content/article/PII:S0162013420301987?httpAccept=text/xml; https://api.elsevier.com/content/article/PII:S0162013420301987?httpAccept=text/plain</p>						
16	<p>doi:10.1039/D0DT01123A Title Authors DOI Type Published in Published by ISSNs Subject Link</p>	<p>Synthesis and characterisation of Co(III) complexes of N-formyl hydroxylamines and antibacterial activity of a Co(III) peptide deformylase inhibitor complex Máté Kozsup; Donal M. Keogan; Deirdre Fitzgerald-Hughes; Éva A. Enyedy; Brendan Twamley; Péter Buglyó; Darren M. Griffith doi:10.1039/D0DT01123A Journal article Dalton Transactions Royal Society of Chemistry (RSC) 1477-9226; 1477-9234 Inorganic Chemistry http://pubs.rsc.org/en/content/articlepdf/2020/DT/D0DT01123A</p>	HU, IE	N	Y	N	Health, demographic change and wellbeing	Y
17	<p>doi:10.1021/acs.inorgchem.0c01119 Title Authors</p>	<p>Nickel(II), Copper(II) and Palladium(II) Complexes with Bis-Semicarbazide Hexaazamacrocycles: Redox-Noninnocent Behavior and Catalytic Activity in Oxidation and C–C Coupling Reactions Anatolie Dobrov; Anastasia Fesenko;</p>	AT, PT, SK	N	Y	N	Health, demographic change and wellbeing	Y

	<p>DOI Type Published in Published by ISSNs Subjects Link</p>	<p>Alexander Yankov; Iryna Stepanenko; Denisa Darvasiová; Martin Breza; Peter Rapta; Luísa M. D. R. S. Martins; Armando J. L. Pombeiro; Anatoly Shutalev; Vladimir B. Arion doi:10.1021/acs.inorgchem.0c01119 Journal article Inorganic Chemistry American Chemical Society (ACS) 0020-1669; 1520-510X Inorganic Chemistry; Physical and Theoretical Chemistry https://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.0c01119</p>						
18	<p>doi:10.3390/chemosensors8040111 Title Authors DOI Type Published in Published by ISSN Subjects Link</p>	<p>DFO@EVOH and 3,4-HP@EVOH: Towards New Polymeric Sorbents for Iron(III) Giancarla Alberti; Camilla Zaroni; Lisa Rita Magnaghi; Maria Amélia Santos; Valeria Marina Nurchi; Raffaella Biesuz doi:10.3390/chemosensors8040111 Journal article Chemosensors MDPI AG 2227-9040 Physical and Theoretical Chemistry; Analytical Chemistry https://www.mdpi.com/2227-9040/8/4/111/pdf</p>	IT, PT	Y	Y	N	Health, demographic change and wellbeing	Y
19	<p>doi:10.1016/j.molliq.2020.114349 Title Authors DOI</p>	<p>Complexation of environmentally and biologically relevant metals with bifunctional 3-hydroxy-4-pyridinones Anna Irto; Paola Cardiano; Karam Chand; Rosalia Maria Cigala; Francesco Crea; Concetta De Stefano; Giuseppe Gattuso; Silvio Sammartano; Maria Amélia Santos doi:10.1016/j.molliq.2020.114349</p>	IT, PT	N	Y	N	Food security, sustainable agriculture and forestry, marine and maritime and inland water reasearch, and the Bioeconomy	Y

	Type Published in Published by ISSN Subjects Links	Journal article Journal of Molecular Liquids Elsevier BV 0167-7322 Materials Chemistry; Physical and Theoretical Chemistry; Spectroscopy; Condensed Matter Physics; Atomic and Molecular Physics, and Optics; Electronic, Optical and Magnetic Materials https://api.elsevier.com/content/article/PII:S0167732220341817?httpAccept=text/xml ; https://api.elsevier.com/content/article/PII:S0167732220341817?httpAccept=text/plain						
20	doi:10.1039/d0qi00912a Title Authors DOI Type Published in Published by ISSN Subject Link	Stabilization of polyiodide networks with Cu(ii) complexes of small methylated polyazacyclophanes: shifting directional control from H-bonds to I⋯I interactions Álvaro Martínez-Camarena ; Matteo Savastano ; José M. Linares ; Begoña Verdejo ; Antonio Bianchi ; Enrique García-España ; Carla Bazzicalupi doi:10.1039/d0qi00912a Journal article Inorganic Chemistry Frontiers Royal Society of Chemistry (RSC) 2052-1553 Inorganic Chemistry http://pubs.rsc.org/en/content/articlepdf/2020/QI/DOQI00912A	IT, ES	N	Y	N	Climate action, environment, resource efficiency and raw materials	Y
21	doi:10.3390/molecules25143155 Title Authors	Stabilisation of Exotic Tribromide (Br ₃ ⁻) Anions via Supramolecular Interaction with a Tosylated Macrocyclic Pyridinophane. A Serendipitous Case Álvaro Martínez-Camarena ; Matteo Savastano ; Carla Bazzicalupi ; Antonio	IT, ES	Y	Y	N	Climate action, environment, resource efficiency and raw materials	Y

	<p>DOI Type Published in Published by ISSN Subjects</p> <p>Link</p>	<p>Bianchi; Enrique García-España doi:10.3390/molecules25143155 Journal article Molecules MDPI AG 1420-3049 Chemistry (miscellaneous); Analytical Chemistry; Organic Chemistry; Physical and Theoretical Chemistry; Molecular Medicine; Drug Discovery; Pharmaceutical Science https://www.mdpi.com/1420-3049/25/14/3155/pdf</p>						
22	<p>doi:10.1021/acs.inorgchem.0c02171 Title</p> <p>Authors</p> <p>DOI Type Published in Published by ISSNs Subjects</p> <p>Links</p>	<p>Different Behavior of the Histidine Residue toward Cadmium and Zinc in a Cadmium-Specific Metallothionein from an Aquatic Fungus Monica Perinelli; Matteo Tegoni; Eva Freisinger doi:10.1021/acs.inorgchem.0c02171 Journal article Inorganic Chemistry American Chemical Society (ACS) 0020-1669; 1520-510X Inorganic Chemistry; Physical and Theoretical Chemistry http://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.0c02171; https://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.0c02171</p>	IT, CH	N	Y	N	Health, demographic change and wellbeing	Y
23	<p>doi:10.1021/acs.inorgchem.0c01210 Title</p> <p>Authors</p> <p>DOI</p>	<p>Comparative Structural Study of Metal-Mediated Base Pairs Formed outside and inside DNA Molecules Alicia Dominguez-Martin; Simona Galli; José A. Dobado; Noelia Santamaría-Díaz; Antonio Pérez-Romero; Miguel A. Galindo doi:10.1021/acs.inorgchem.0c01210</p>	IT, ES	N	Y	N	Health, demographic change and wellbeing	Y

	Type Published in Published by ISSNs Subjects Link	Journal article Inorganic Chemistry American Chemical Society (ACS) 0020-1669 ; 1520-510X Inorganic Chemistry; Physical and Theoretical Chemistry https://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.0c01210						
24	doi:10.3390/ph13090228 Title Authors DOI Type Published in Published by ISSN Subjects Link	Zinc(II)—The Overlooked Éminence Grise of Chloroquine’s Fight against COVID-19? Aleksandra Hecel ; Małgorzata Ostrowska ; Kamila Stokowa-Sołtys; Joanna Wąty; Dorota Dudek ; Adriana Miller; Sławomir Potocki; Agnieszka Matera-Witkiewicz ; Alicia Dominguez-Martin; Henryk Kozłowski; Magdalena Rowińska-Żyrek doi:10.3390/ph13090228 Journal article Pharmaceuticals MDPI AG 1424-8247 Drug Discovery; Pharmaceutical Science; Molecular Medicine https://www.mdpi.com/1424-8247/13/9/228/pdf	PL, ES	Y	Y	N	Health, demographic change and wellbeing	Y
25	doi:10.1016/j.jinorgbio.2020.111199 Title Authors DOI Type Published in Published by ISSN	Alcian blue pyridine variant interaction with DNA and RNA polynucleotides and G-quadruplexes: changes in the binding features for different biosubstrates Francesca Macii; Cristina Perez-Arnaiz; Lorenzo Arrico; Natalia Busto; Begona Garcia; Tarita Biver doi:10.1016/j.jinorgbio.2020.111199 Journal article Journal of Inorganic Biochemistry Elsevier BV 0162-0134	IT, ES	N	Y	N	Health, demographic change and wellbeing	Y

	Subjects Links	Inorganic Chemistry; Biochemistry https://api.elsevier.com/content/article/PII:S0162013420302270?httpAccept=text/xml ; https://api.elsevier.com/content/article/PII:S0162013420302270?httpAccept=text/plain						
26	doi:10.1039/D0DT02125C Title Authors DOI Type Published in Published by ISSNs Subject Link	Targeting G-quadruplex structures with Zn(ii) terpyridine derivatives: a SAR study Natalia Busto ; M. Carmen Carrión; Sonia Montanaro; Borja Díaz de Greñu ; Tarita Biver ; Felix A. Jalón ; Blanca R. Manzano ; Begoña García doi:10.1039/D0DT02125C Journal article Dalton Transactions Royal Society of Chemistry (RSC) 1477-9226 ; 1477-9234 Inorganic Chemistry http://pubs.rsc.org/en/content/articlepdf/2020/DT/D0DT02125C	IT, ES	N	Y	N	Health, demographic change and wellbeing	Y
27	doi:10.1039/D0DT01626H Title Authors DOI Type Published in Published by ISSNs Subject Link	Novel insights into the metal binding ability of ZinT periplasmic protein from Escherichia coli and Salmonella enterica Denise Bellotti ; Magdalena Rowińska-Żyrek ; Maurizio Remelli doi:10.1039/D0DT01626H Journal article Dalton Transactions Royal Society of Chemistry (RSC) 1477-9226 ; 1477-9234 Inorganic Chemistry http://pubs.rsc.org/en/content/articlepdf/2020/DT/D0DT01626H	IT, PL	N	Y	N	Health, demographic change and wellbeing	Y
28	doi:10.1021/acs.inorgchem.9b03737		IT, PL	N	Y	N	Health, demographic	Y

	<p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSNs</p> <p>Subjects</p> <p>Links</p>	<p>Exploring the Specificity of Rationally Designed Peptides Reconstituted from the Cell-Free Extract of <i>Deinococcus radiodurans</i> toward Mn(II) and Cu(II)</p> <p>Massimiliano Peana; Elzbieta Gumienna-Kontecka; Francesca Piras; Malgorzata Ostrowska; Karolina Piasta; Karolina Krzywoszynska; Serenella Medici; Maria Antonietta Zoroddu</p> <p>doi:10.1021/acs.inorgchem.9b03737</p> <p>Journal article</p> <p>Inorganic Chemistry</p> <p>American Chemical Society (ACS)</p> <p>0020-1669; 1520-510X</p> <p>Inorganic Chemistry; Physical and Theoretical Chemistry</p> <p>http://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.9b03737; https://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.9b03737</p>					change and wellbeing	
29	<p>doi:10.1039/d0dt02644a</p> <p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSNs</p> <p>Subject</p> <p>Link</p>	<p>Al(iii)-NTA-fluoride: a simple model system for Al-F binding with interesting thermodynamics</p> <p>Eliška Hacaperková; Adam Jaroš; Jan Kotek; Johannes Notni; Michal Straka; Vojtěch Kubíček; Petr Hermann</p> <p>doi:10.1039/d0dt02644a</p> <p>Journal article</p> <p>Dalton Transactions</p> <p>Royal Society of Chemistry (RSC)</p> <p>1477-9226; 1477-9234</p> <p>Inorganic Chemistry</p> <p>http://pubs.rsc.org/en/content/articlepdf/2020/DT/D0DT02644A</p>	CZ, DE	N	Y	N	Climate action, environment, resource efficiency and raw materials	Y
30	<p>doi:10.3389/fchem.2020.597400</p> <p>Title</p>	<p>Chelating Agents in Soil Remediation: A New Method for a Pragmatic Choice of the Right Chelator</p>	IT, PL	Y	Y	N	Health, demographic change and wellbeing	Y

	<p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSN</p> <p>Subject</p> <p>Link</p>	<p>Valeria Marina Nurchi; Rosita Cappai; Guido Crisponi; Gavino Sanna; Giancarla Alberti; Raffaella Biesuz; Sofia Gama</p> <p>doi:10.3389/fchem.2020.597400</p> <p>Journal article</p> <p>Frontiers in Chemistry</p> <p>Frontiers Media SA</p> <p>2296-2646</p> <p>General Chemistry</p> <p>https://www.frontiersin.org/articles/10.3389/fchem.2020.597400/full</p>						
31	<p>doi:10.1021/acs.inorgchem.0c00925</p> <p>Title</p> <p>Authors</p> <p>DOI</p> <p>Type</p> <p>Published in</p> <p>Published by</p> <p>ISSNs</p> <p>Subjects</p> <p>Link</p>	<p>Copper Complexes with 1,10-Phenanthroline Derivatives: Underlying Factors Affecting Their Cytotoxicity</p> <p>Patrique Nunes; Isabel Correia; Fernanda Marques; António Pedro Matos; Margarida M. C. dos Santos; Cristina G. Azevedo; José-Luis Capelo; Hugo M. Santos; Sofia Gama; Teresa Pinheiro; Isabel Cavaco; João Costa Pessoa</p> <p>doi:10.1021/acs.inorgchem.0c00925</p> <p>Journal article</p> <p>Inorganic Chemistry</p> <p>American Chemical Society (ACS)</p> <p>0020-1669; 1520-510X</p> <p>Inorganic Chemistry; Physical and Theoretical Chemistry</p> <p>https://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.0c00925</p>	PL, PT	N	Y	N	Health, demographic change and wellbeing	Y
32	<p>doi:10.1021/acs.organomet.1c00270</p> <p>Title</p> <p>Authors</p>	<p>A Strategy to Conjugate Bioactive Fragments to Cytotoxic Diiron Bis(cyclopentadienyl) Complexes</p> <p>Silvia Schoch; Mouna Hadiji; Sarah A. P. Pereira; M. Lúcia M. F. S. Saraiva; Simona Braccini; Federica Chiellini; Tarita Biver; Stefano Zacchini; Guido Pampaloni;</p>	IT, PT, CH	N	Y	N	Health, demographic change and wellbeing	Y

	DOI Type Published in Published by ISSNs Subjects Link	Paul J. Dyson ; Fabio Marchetti doi:10.1021/acs.organomet.1c00270 Journal article Organometallics American Chemical Society (ACS) 0276-7333 ; 1520-6041 Inorganic Chemistry; Organic Chemistry; Physical and Theoretical Chemistry https://pubs.acs.org/doi/pdf/10.1021/acs.organomet.1c00270						
33	doi:10.1021/acs.inorgchem.1c01622 Title Authors DOI Type Published in Published by ISSNs Subjects Link	Thermodynamic Stability and Speciation of Ga(III) and Zr(IV) Complexes with High-Denticity Hydroxamate Chelators Yuliya Toporivska; Andrzej Mular; Karolina Piasta ; Małgorzata Ostrowska; Davide Illuminati; Andrea Baldi; Valentina Albanese ; Salvatore Pacifico; Igor O. Fritsky ; Maurizio Remelli; Remo Guerrini; Elzbieta Gumienka-Kontecka doi:10.1021/acs.inorgchem.1c01622 Journal article Inorganic Chemistry American Chemical Society (ACS) 0020-1669 ; 1520-510X Inorganic Chemistry; Physical and Theoretical Chemistry https://pubs.acs.org/doi/pdf/10.1021/acs.inorgchem.1c01622	UA, IT, PL	N	Y	N	Health, demographic change and wellbeing	Y

Projects resulting from Action activities

Please enter below all the projects on the topic of the Action resulting from Action activities, involving at least one Action participant, and for which the Action networking was necessary.

The Action reported 3 project(s) and 3 proposal(s) resulting from the Action networking.

Key details of the projects are shown below.

#	Title	Countries participating in the Action among proposers	Main proposer name	Funder	Amount	Call identifier	Relevance to H2020 Societal Challenge
1	Understanding copper speciation and redox transformations in seawater	HR, FR, HU, CH	Elvira Bura Nakić	Trans-national	470000 €	IPCH 2020	Food security, sustainable agriculture and forestry, marine and maritime and inland water reasearch, and the Bioeconomy
2	Comparative studies on structures, solution chemical properties and anticancer activity of thiosemicarbazones and tyrosine kinase inhibitors	AT, HU	Eva Anna Enyedy	National	5600 €	National Research, Development and Innovation Office	Health, demographic change and wellbeing
3	Tryptophan Metabolites and their Metal Complexes as new drugs for Colorectal Cancer Treatment and Human Gut Microbiota Regulation	DE, IT, PL, PT	Sofia Gama	National	400000 €	OPUS-20	Health, demographic change and wellbeing

Other outputs / achievements

Please enter below any additional outputs/ achievements on the topic of the Action that contribute to the COST mission: “COST enables break-through scientific developments leading to new concepts and products and thereby contributes to strengthen Europe’s research and innovation capacities”, and for which the Action networking was necessary (e.g. a patent, standards, white paper).

Output / achievement description	Dependence of achievement on the Action networking

Impacts

Please describe the impacts (the short- to long-term scientific, technological, and / or socioeconomic changes produced by a COST Action, directly or indirectly, intended or unintended) that have resulted, or might result, from the Action in the following table (one impact per line).

Description of the impact, i.e. what will change, and for whom, as a result of what the Action achieved	Type of impact	Timing of impact
NECTAR is structuring of the widest community, at the European level, of experts in the study of the thermodynamics of chemical transformations and chemical equilibria, acting as a reference for all stakeholders needing expertise in this field.	<ul style="list-style-type: none"> • Scientific / Technological • Economic • Societal 	Achieved
NECTAR is coordinating research of this Action with the aim to tackle technological and experimental challenges at a top methodological level.	<ul style="list-style-type: none"> • Scientific / Technological • Economic • Societal 	Achieved
NECTAR is publishing and communicating and disseminating in the scientific community new methodologies for the study of chemical equilibria, which will support major stakeholders in the area of biology, medicine, environmental sciences and industry.	<ul style="list-style-type: none"> • Scientific / Technological • Economic • Societal 	Achieved
NECTAR is identifying problems and challenges both of wide interest for the scientific community studying the equilibria in chemical transformations and/or of more specific interest for stakeholders. This will provide solutions, methodologies and technological advancements that will be beneficial for the whole society.	<ul style="list-style-type: none"> • Scientific / Technological • Economic • Societal 	Foreseen within two years of the end of the Action
NECTAR represents an added value through the distribution of new products (instrumentation, software) for all stakeholders who need to exploit and/or work in the field of chemical thermodynamics.	<ul style="list-style-type: none"> • Scientific / Technological • Economic • Societal 	Foreseen within two years of the end of the Action
NECTAR is training of young (ECIs) researchers through the sharing of expertise and facilities across and outside Europe, through STSMs and other networking activities. This will ensure that excellence in this field will be continued long after the end of the Action, creating the so-called "thermodynamic minds".	<ul style="list-style-type: none"> • Scientific / Technological • Economic • Societal 	Foreseen two-to-five years after the end of the Action
NECTAR will support further applications for funding and grants to national and trans-national agencies.	<ul style="list-style-type: none"> • Scientific / Technological • Economic • Societal 	Foreseen by the end of the Action
NECTAR is developing new apparatus and software for data acquisition and treatment in collaboration with manufacturers and software developers	<ul style="list-style-type: none"> • Scientific / Technological • Economic • Societal 	Foreseen by the end of the Action

Please describe how the Action is advancing the careers, skills and network of researchers, including ECIs (for example: joint supervision of graduate and PhD students, research exchanges not funded by the Action, collaborations, Training Schools with ECTS accreditation, joint projects and jobs prospects).

NECTAR is promoting the rise and consolidation of a community of researchers with a high expertise in the study of chemical equilibria, to develop new methodologies for the study of chemical systems and processes. NECTAR activity is at the interface of core chemistry, biology, environmental sciences, and industrial research, and is providing new technological tools and methods to impact the research on chemical equilibria in all these areas. NECTAR is involving the principal users and developers of methods for the study of chemical thermodynamics. This collaboration is boosting the knowledge in this field beyond the state-of-the-art. The establishment of standardised procedures between different laboratories, the test of apparatus developed by manufacturers, are providing the research groups with new and reliable methodologies, even helping the manufacturers to bring innovative technologies to the market.

Meetings, TSs and STSMs are being employed to share, communicate and disseminate of top-level knowledge. All partners are invited to share new ideas, concepts, techniques and new scientific problems and questions, creating strong collaborative working groups. This is making NECTAR contributing to an outstanding level of knowledge creation and transfer of knowledge, and acting as a pole of attraction for all actors interested in joining an excellent and efficient network. Together, they are providing a concrete chance to identify common issues and challenges and to find integrated solutions for researchers whose collaborations are usually limited to a narrow group of scientists, favouring a better rationalization and harmonization of available resources. Also, NECTAR is providing a unique opportunity to ECIs to acquire new skills, and to share information on main challenges in the study of chemical thermodynamics, supporting them in developing their independent careers and reaching leadership positions and higher visibility and ensuring that excellence in this field will be continued long after the end of the Action.

The career benefits are mainly to researchers with the following amount of experience after their PhD: ≤ 8 years.

Which of the stakeholders described in the “Plan for involving the most relevant stakeholders” in the Action’s MoU have been engaged and how? What additional stakeholders have been, or will be, engaged and how?

The members of NECTAR are among the world leaders in chemical thermodynamics, and already involved in the study of systems at the interface between chemistry, biology, environmental science, and fine chemicals of interest for chemical industries. Therefore, NECTAR is already representing a great opportunity to join all this expertise and to focus on key challenges that need to be tackled in a coordinated manner. This is be beneficial for the development of knowledge in the area of interest of all stakeholders like industries, software and instrument developers, institution and the general public. Since its start, 1 big enterprise and 3 SMEs already joined NECTAR and are exploiting its unique features, while other companies already showed their interest in joining the action in the near future. Several NECTAR members already have ongoing collaborations with national institutions and private companies, exploiting their expertise on equilibria and chemical thermodynamics to provide consultancies and solutions in many fields (environmental, technological/industrial).

Dissemination and exploitation of Action results (other than co-authored Action publications listed previously)

Please describe the Action's dissemination and exploitation approach as well as all activities undertaken to ensure dissemination and exploitation of the Action results and the effectiveness of these activities.

Dissemination and exploitation approach of the Action

NECTAR aims to strengthen the impact of the study of chemical equilibria in Science through the setup of the largest European community of experts in this field. All partners are involved in strong networking activities to share their expertise, facilities, and results. Beyond it, communication and dissemination of results and information activities are taking place. In addition to the audience represented by potential stakeholders, undergraduate students and general public are "targets" considered. Outreach communication and dissemination activities are mainly exploited as follows: - Making the scientific community aware of NECTAR activities. Participation in conferences and workshops is strongly encouraged. Publication of papers in scientific, peer-reviewed journals is also increasing NECTAR visibility to a broader audience, attracting new partners and ECIs. - Attracting EU leaders in the study of chemical equilibria and non-EU world leaders. Communication and dissemination through invited seminars, master/PhD-level courses, summer schools is taking place. - NECTAR members are developing new methods, instrumentation, and software, and are attempting to maximize their participation in trade-fairs, industry exhibitions and forums. - NECTAR members are pursuing the communication and dissemination outside the scientific community. As examples, NECTAR activities are presented at events for citizens, open-days at universities, presentations at schools.

Dissemination

Dissemination meetings funded by the Action

Title of Dissemination meeting	Meeting date	Meeting country	Action participant	Event name and hyperlink to the website	Title of presentation	Description of added value to the Action
N/A						

Other dissemination activities

E.g. participation to non-Action meetings, e.g. EU Parliament, meetings with policy makers, experts in the field, regional authorities.

Item/activity	Target audience	Outcome	Hyperlink
Dissemination of main NECTAR results through social media (Facebook, Twitter, Instagram, LinkedIn and researchgate)	General public (through general socials) and stakeholders (through specialized media like linkedin and researchgate)	Several requests to join the action. Request of support to solve issues in the field of chemical thermodynamics.	https://cost-nectar.eu/
Participation to the International	Other stakeholders involved/interested in	Involvement of other stakeholders in the	https://ismec2021.org/

Symposium on Thermodynamics of Metal Complexes - ISMEC 2021. promotion of the Action by NECTAR invited members	the field of the Thermodynamics of Complexes.	Action, dissemination activities, communication of results	
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Exploitation activities

Please describe below any activities undertaken to ensure exploitation (use, in particular in a commercial context) of the Action's achievements.

Item/activity	Target audience	Outcome
PANEL DISCUSSION co-organized by NECTAR on "COST ACTIONS – Operational issues" April 16th, 2021	General public and Italian COST Actions members and potential stakeholders	The panel discussion involved NECTAR AC, GHRSR, SO and AO, the Italian CNC and other ACs of COST Actions led by Italian ACs. NECTAR and other actions activities were presented to general public, giving emphasis to the importance of chemical thermodynamics on daily life.

Other matters

This section is confidential to the Management Committee, the Action Rapporteur and the COST Association, and is not included in the version of the report that is published on the COST website.

Difficulties in implementing the Action

If any difficulties are experienced in the implementation of the Action (e.g. imbalances of participation across the Working Groups, inactive country representatives) please describe these below. Please also describe the efforts made by the MC to address these.

Of course, pandemics and lockdown slowed some NECTAR Activities. Nevertheless, MC and WGs organized online meetings to bypass these issues, with success. NECTAR is also experiencing the scarce involvement of some MC members from some countries. In this light, AC reported issues in various MC and CG meetings, as well as in a letter addressed to COST Association (Science operations) and dated April 15th, 2021

Endangerment Measures

Taking into account the issues identified throughout this report, please summarise the measures the Action will implement in the coming two years to overcome any issues identified as potentially endangering the achievement of the objectives of the Action.

NECTAR will encourage active participation of its members in the decisional process, and involving more directly CG. NECTAR will pay attention in accepting new membership requests, trying to involve only member countries and MC members only concretely interested in Action Activities.

Suggestions for improvements to COST framework/ procedures

The mandate of the Scientific Committee includes providing advice to the COST Committee of Senior Officials on possible improvements to the COST framework. Please describe below any improvements that you believe should be made to the COST framework.

NECTAR would recommend a greater attention to the nominations done by CNCs and a periodical check of the real involvement of MC members on Action activities providing, if possible, tools for replacements and/or for "removing" inactive member Countries. NECTAR highly recommends, to bypass the above issues, to give the MC the possibility to appoint in management positions even non MC-members (always through MC voting). This would allow Actions to have active people in right positions, which is actually hampered by the necessity to have only MC members appointed (especially during kick-off meeting).

Sustaining the network beyond the Action

Are there any plans to sustain the network beyond the end of the Action?

YES

Please describe how the network will be sustained beyond the end of the Action.

The NECTAR community is consolidated enough to "survive" beyond the end of the Action. New projects are already

planned/submitted, and networking activities and collaborations are already being performed even outside action itself. The training of ECIs and the new "thermodynamic minds" will ensure a high standard for future research in the field of chemical thermodynamics. Dissemination and communication activities are already promoting public awareness of the importance of this field in daily life, ensuring a high interest for NECTAR activities even beyond the Action end.

Emerging topics/ developments in the field of the Action

Please describe any emerging topics or potentially important future developments identified during the Action and that could potentially be addressed by future COST activities such as Actions S&T Conferences or Exploratory Workshops.

The field of application of equilibria and chemical thermodynamics is so broad that new challenges are already emerging. The continuous need of more performing instrumentation and software, new reliable data and new methodologies makes the research in this field always at cutting-edge. In particular, the field of chemical equilibria and chemical thermodynamics is finding new perspectives, for example, in the modelling of surface/solution interactions, in new materials, and in the optimization of new techniques.

Annex 1: Types of objectives

1 - Coordination of scientific and technological activities at a European level

- 1.a - Development of a common understanding/definition of the subject matter
- 1.b - Coordination of information seeking, identification, collection and/or data curation
- 1.c - Coordination of experimentation or testing
- 1.d - Comparison and/or performance assessment of a theory, model, methodology, technology or technique
- 1.e - Development of knowledge needing international coordination, pertaining to a new or improved theory, model, methodology, technology or technique
- 1.f - Achievement of a specific tangible output that cannot be achieved without international coordination (e.g. due to practical issues such as database availability, language barriers, availability of infrastructure or know-how, etc.)
- 1.g - Input to stakeholders (e.g. standardization body, policy-makers, regulators, users), excluding commercial applications
- 1.h - Input for future market applications (including cooperation with private enterprises)
- 1.i - Dissemination of research results to the general public
- 1.j - Dissemination of research results to stakeholders (excluding specific input in view of knowledge application)

2 - Community building

- 2.a - Building a community around a topic of scientific and/or socio-economic relevance, allowing for knowledge exchange and the development of a joint research agenda
- 2.b - Building a community around a new or emerging field of research
- 2.c - Bridging separate fields of science/disciplines to achieve breakthroughs that require an interdisciplinary approach
- 2.d - Acting as a stakeholder platform or trans-national practice community, pertaining to a certain area of socio-economical or societal application, or to a certain market sector
- 2.e - Building capacity in the demographic inclusiveness of networks in science and technology, including representation of newly established research groups, Early-Career Investigators, the under-represented gender and teams from countries/regions with less capacity in the field of the Action

Annex 2: Dimensions of successes

1 - Breakthroughs

- 1.a - Scientific breakthrough
- 1.b - Technological breakthrough
- 1.c - Breakthrough in socio-economic or societal applications

2 - Policy contribution

- 2.a - Contribution to regulatory policy
- 2.b - Contribution to environmental, infrastructural or agricultural policy
- 2.c - Contribution to economic or socio-economic policy
- 2.d - Contribution to social, cultural or legal policy

3 - Capacity building

- 3.a - Building capacity in an existing field of science and technology
- 3.b - Building capacity in bridging separate fields of science and technology
- 3.c - Building capacity in a new or emerging field of science and technology
- 3.d - Building capacity in valorising and implementing advances and applications in science and technology
- 3.e - Building capacity in the demographic inclusiveness of networks in science and technology, including representation of newly established research groups, Early-Career Investigators, the under-represented gender and teams from countries/regions with less capacity in the field of the Action