

AQUALity

First year of communication and dissemination activities 2018-2019

The aim of this booklet is to collect all the communication and dissemination activities carried out during the first year of AQUALity action by consortium members and ESRs.

Following the philosophy of the consortium, several events were organised by ESRs during secondments period at the host institutions and several of them were carried out by many ESRs together. This was pursued in order to make strong interactions between ESRs and between ESRs and AQUALity team, as we strongly believe that good collaborations arise from good friendships and, in turn, good relationships can strengthen a research group and bring novelty to research activities.

The AQUALity Consortium



AQUALity

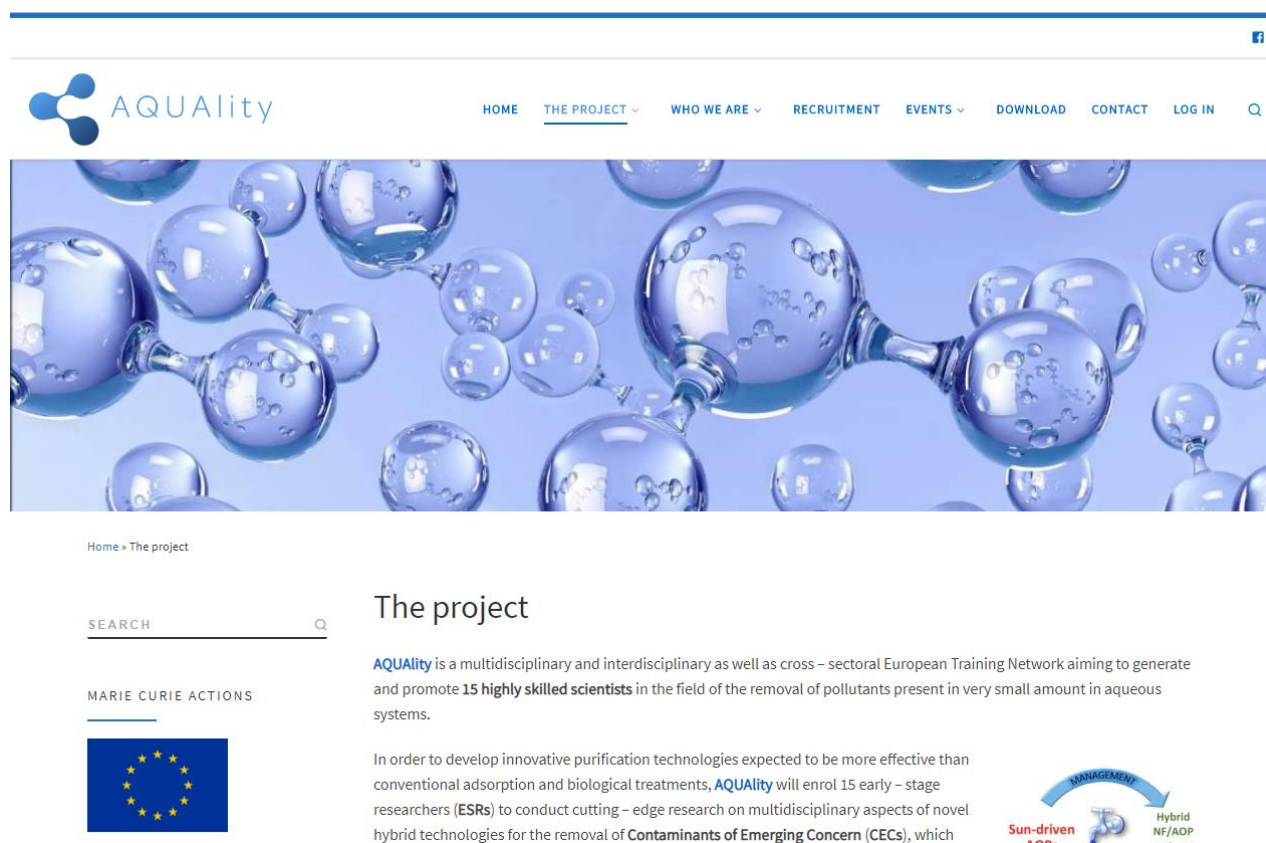
This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860



Presentation of the AQUALity project

AQUALITY WAS BORN!

The beginning of AQUALity activities were announced in the social network Facebook and in the official website of the project (<https://www.aquality-etn.eu/>), October 2017.



AQUALITY CONSORTIUM PRESENTS TO THE WORLD!

The AQUAlity activities are presented to the world by:

- **Communication at meetings**
- **a Leaflet**
- **a Poster** presented at international workshops and meetings reporting information about project participants and research activities
- **a Newsletter** published every 6 months, spread by email and uploaded on the AQUAlity website

ASTANA 2017 – FUTURE ENERGY – PIEMONTE

Astana (Kazakhstan)



EXPO 2017
• **Future Energy** •
Astana Kazakhstan



FORUM of EFIAQUA

Valencia (Spain)




INNOVACIÓN Y GESTIÓN DEL CONOCIMIENTO en el ciclo integral del agua

9.30 **Presentación de la jornada**
_José Claramonte, Director General FACSA

10.00 **La cultura de la innovación en la gestión del agua**
_ZERO BRINE. Un nuevo enfoque de economía circular basado en la recuperación de salmueras generadas en procesos industriales. *Elena Zurlaga, Técnico de I+D+i FACSA*
_AQUALITY. Red europea de Investigación enfocada al desarrollo de nuevas tecnologías híbridas de eliminación de contaminantes emergentes. *Isabel Tormos, Técnico de I+D+i FACSA*
_HYDRES. La dinámica de fluidos computacional al servicio de las EDAR. *Javier Climent, Técnico de I+D+i FACSA*

10.45 **COFFEE BREAK**

11.00 **Nuevas tecnologías para el ciclo integral del agua**
_Sistemas de FACSA (Centro control y telecontrol en abastecimiento y saneamiento). *Javier Maximino, Responsable Sistemas FACSA*
_Telelectura (operativa e implementación). *Fernando Bagán, Subdirector Área Abastecimiento FACSA*
_Smart Water y WIM. *Miguel Ángel Royo, CEO IoTsens e Iker Alvarado, Jefe de Proyecto WIM.*

12.00 **El compromiso por la divulgación en el sector del agua**
_Cátedra FACSA- Universidad Jaume I. *Sergio Chiva, Director Cátedra del Agua FACSA-UJI*
_Proyecto educativo "El curso del agua" + Proyecto social AUARA. *Pilar Soria, Responsable RSE FACSA*

12.45 **Mesa redonda. Startups en el sector del agua. Más que innovación, disrupción**
Vicente Molina, Responsable de Desarrollo de Negocio GRUPO GIMENO
_BIOTICA. *Guillermo Rodríguez, Director de I+D+i de BIOTICA*
_TECH4+. *Diego Fernandez Polanco, Director de operaciones de TECH4+*
_Greene waste to energy. *Jesús Martínez, Director comercial de GREENE*
Moderadora. *Gemma Martínez, Jefa de Economía LEVANTE-EMV*

13.45 **Clausura de la jornada**
_Ricardo Sáez, Director General de SITRA

29
NO
VIEM
BRE

FERIA VALENCIA
pabellón 5
Nivel 1/
zona demo

INSCRIPCIÓN GRATUITA


www.jornadafacsaeftaqua.com


CHIMICA PASSIONE PERIODICA Torino (Italy)



Ambiente| Chimica verde, economia circolare

Thursday 5th July 2018, h 14.00

Un uso efficiente delle risorse per migliorare il nostro impatto sul pianeta

Interdisciplinary cross-sectoral approach to effectively address the removal of contaminants of emerging concern from water



E' un progetto H2020-MSCA-ITN che ha arruolato 15 ricercatori per condurre ricerche di carattere multidisciplinare volte alla messa a punto di nuove tecnologie ibride per la rimozione di contaminanti emergenti (CECs). In particolare si affronterà:

1. Analisi dei CECs e dei loro prodotti di trasformazione
2. Sviluppo di nuovi materiali/processi fotochimici
3. Sviluppo di sistemi ibridi basati sulla combinazione nanofiltrazione / processi di ossidazione avanzata.



Durata progetto: 2018-2021

Persone coinvolte UNITO:

P. Calza, G. Magnacca, MC. Paganini, D. Fabbri, M. Minella, E. Laurenti, D. Scalarone, A. Bianco Prevot

Partners:

Aalborg University, VBM and LQT, Denmark; Universitat Politècnica de València, FACSA and CIEMAT, Spain; UPO, IRIS, ISALIT and SMAT, Italy; University of Ioannina, Greece; Ecole Polytechnique, INERIS and CNRS, France; KTU, Turkey; NIVA, Norway

AQUALity LEAFLET



THE PROJECT

AQUALity is a multidisciplinary and interdisciplinary as well as cross-sectorial European Training Network aiming to generate and promote **15 highly skilled scientists** in the field of the removal of pollutants present in very small amount in aqueous systems.

AQUALity is funded by the European Union under the Marie Skłodowska-Curie Actions (MSCA) - Innovative Training Networks

(Call: H2020-MSCA-ITN-2017).
Project N. 765860

CONTACT US

University of Torino
Department of Chemistry
Street Address: Via P. Giuria 7, 10125
City: Torino - Italy
E-mail address: aquality-etn@unito.it



Website:
www.aquality-etn.eu/

Facebook:
www.facebook.com/AQUALityITN2017/

AQUALITY

ITN Marie Curie Action

INNOVATIVE
TECHNOLOGIES FOR
THE REMOVAL OF
CONTAMINANTS OF
EMERGING CONCERN
(CECs)



OVERVIEW

AQUALity is a consortium of eighteen partners from Denmark, France, Greece, Italy, Norway and Spain.

The consortium comprises 7 universities, 3 research institutes and 8 companies with a balanced participation of beneficiaries and partner organizations, academic and non-academic.

TRAINING GOALS

The 15 young scientists will be trained to develop their creativity, critical and autonomous thinking, and entrepreneurial skills, thus boosting their scientific skills and innovation capacity in the field of water treatment technologies. This goal will be attained via a structured training - through - research programme, consisting of original individual research projects (performed both at the beneficiary organisation and through intersectorial secondments) and education on technical and transferable skills.

MAIN RESEARCH LINES

High resolution analytical methods for the determination of CECs in aqueous systems and investigation of their environmental fate

Enhanced photochemical methods for the removal of CECs and pathogens in water and wastewater

Removal of CECs by hybrid membranes/AOP systems



LIST OF PARTICIPANTS

Beneficiaries:

- Università Degli Studi Di Torino (IT)
- Aalborg Universitet (DK)
- Università Degli Studi Del Piemonte Orientale Amedeo Avogadro (IT)
- Universitat Politècnica De Valencia, (ES)
- Panepistimio Ioanninon (GR)
- Ecole Polytechnique (FR)
- Società Metropolitana Acque Torino S.P.A. (IT)
- Karadeniz Teknik Üniversitesi (TK)
- Plataforma Solar De Almería - CIEMAT (ES)
- Liqtech International A/S (DK)
- Centre National De La Recherche Scientifique (FR)

Partners:

- IRIS (IT)
- FACSA (ES)
- INERIS (FR)
- ISALIT (IT)
- MIRTEC (GR)
- NIVA (NO)
- VBM (DK)



AQUALITY POSTER



AQUALITY



AQUALITY is a project funded by the European Union under the Marie Skłodowska-Curie Actions (MSCA) Innovative Training Networks (Call: H2020-MSCA-ITN-2017; Project N. 765860)

Information: website www.aquality.etn.eu / Facebook www.facebook.com/AQUALITYITN2017/

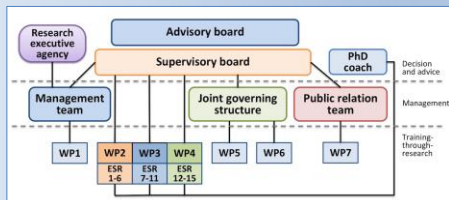
WHAT IS AQUALITY?

AQUALITY is a consortium of eighteen partners. All the participants are mutually involved in scientific and educational tasks, formed in several fields (chemical analysis, environmental fate, photocatalysis, material science, membrane technology and water management), sharing the interest towards environmental studies and determined to achieve the primary objective of guaranteeing access to safe water to the entire society through the formation of young scientists specialist in water treatment.



THE PROJECT

In order to develop innovative purification technologies expected to be more effective than conventional adsorption and biological treatments, AQUALITY enrolled 5 early stage researchers (ESRs) to conduct cutting-edge research on multidisciplinary aspects of novel hybrid technologies for the removal of Contaminants of Emerging Concern (CECs), which comprehend compounds present in very small amount in aqueous systems, having the potential to cause adverse ecological or human health effects.



The above management structure guarantees the development of the following planned work packages:

- WP1 Project management
- WP2 High-resolution analytical methods for the determination of CECs in aqueous systems and investigation of their environmental fate
- WP3 Enhanced photochemical methods for the removal of CECs and pathogens in water and wastewater
- WP4 Removal of CECs by hybrid membranes/AOP systems
- WP5 Recruitment and training
- WP6 Involvement of the industrial partners and result exploitation
- WP7 Data management, dissemination and outreach

RESEARCH METHODOLOGY AND APPROACH

AQUALITY approach is on the complementary expertise of the Consortium members and will benefit of the synergy between academics and non-academics and of the implementation of ESRs in individual projects in three main lines:

1. Analysis of CECs and their transformation products
2. Development of new photochemical materials/processes
3. Hybrid nanofiltration/advanced oxidation (NF/AOP) systems

ORIGINALITY AND INNOVATIVE ASPECTS

Overall approach

Interaction with some of the existing EU projects, for joining together the interdisciplinary training vision of the previous ITN projects within a multidisciplinary and intersectoral Consortium.

Originality

Non-targeted determination and quantification of CECs directly performed on complex environmental matrices. Development of innovative NF-AOP processes. Use of real municipal wastewater treatment plant effluents or contaminated natural waters to test the NF-AOP systems.

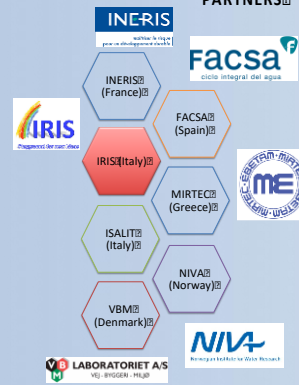
Innovative aspects of the training programme

To provide a comprehensive training offer to future innovators in water treatment, to raise the scientific competence of ESRs in interdisciplinary contexts, to contribute to the European competitiveness in the field of tertiary water treatment.

BENEFICIARIES

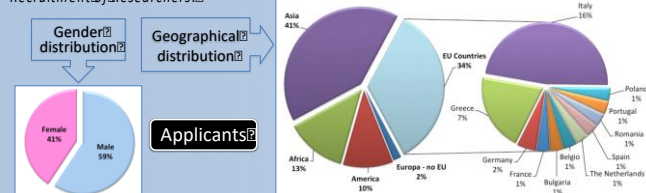


PARTNERS

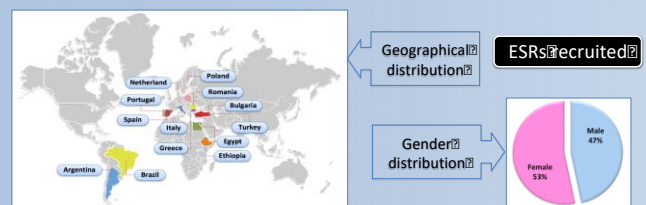


EARLY STAGE RESEARCHERS

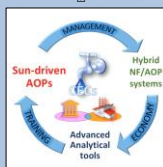
The recruitment procedure was opened on November 16th, 2017 and the CVs of all the eligible applicants were successively considered on the basis of the European Code of Conduct for the Recruitment of Researchers.



ESRs were recruited after interviews with the supervisors and the selection committee.



Each research project addresses a specific issue tailored towards a PhD, and each has been peer-reviewed by the network for scientific rigor and feasibility as a PhD project.



FINAL OBJECTIVES

The 5 ESRs are trained to develop their creativity, critical and autonomous thinking, and entrepreneurial skills, thus boosting their scientific skills and innovation capacity in the field of water treatment technologies. This goal will be attained via a structured training through a research programme, consisting of original individual research projects (performed both at the beneficiary organisation and through intersectoral secondments) and education on technical and transferable skills (performed both at local level and with network-wide events).



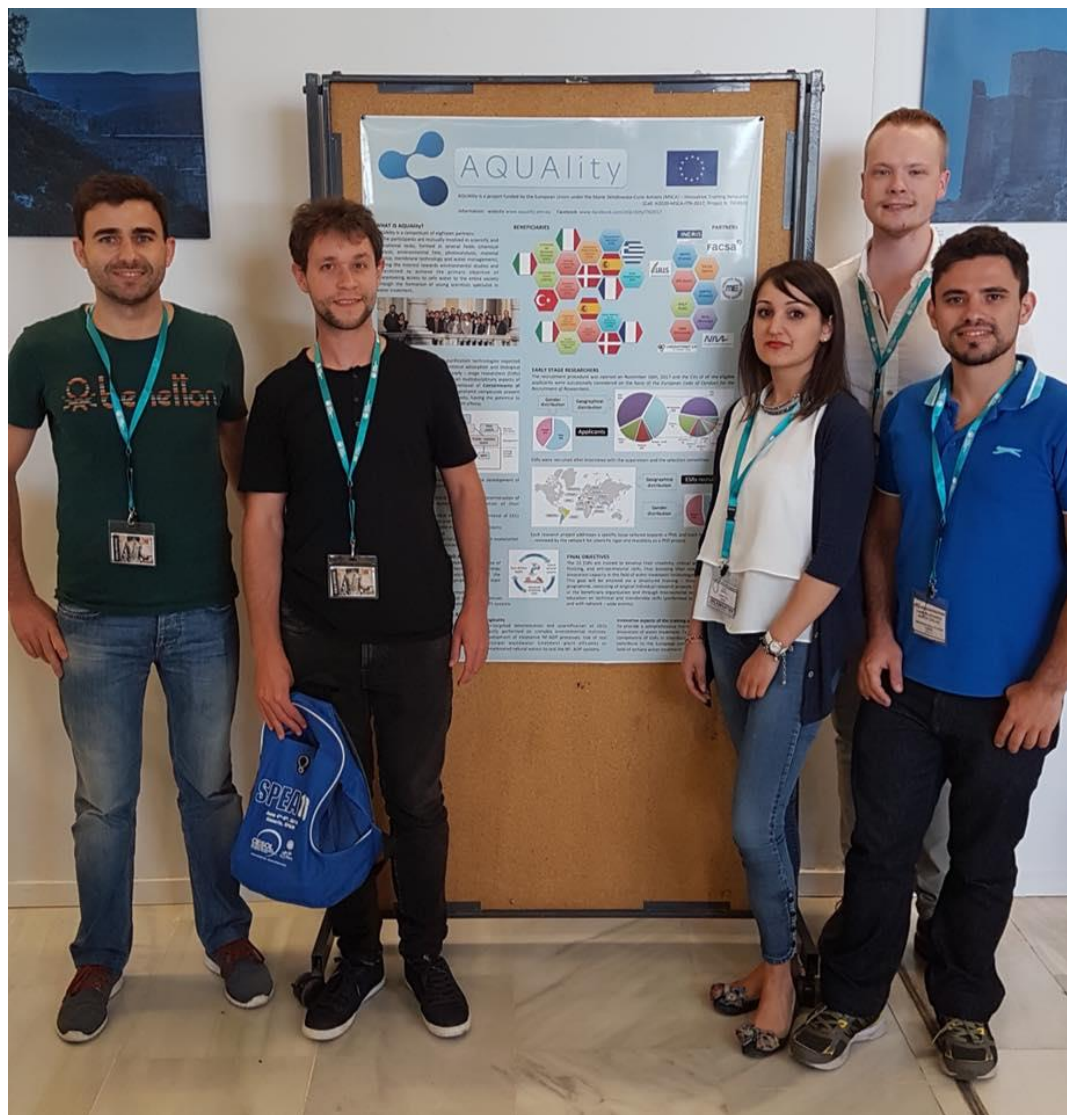
AQUALITY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860



10th European meeting on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA10)

Almería (Spain)



NEWSLETTER N.1

N. 1 (MAY 2018)

AQUALITY NEWSLETTER



PROJECT,
PARTNERS &
BENEFICIARIES



WORKSHOP ON PHD
SUPERVISION &
KICK-OFF MEETING



FIRST AQUALITY
SYMPOSIUM & SUMMER
SCHOOL



NEXT EVENTS
&
ACTIVITIES



AQUALity NEWSLETTER

Project summary

AQUALity is a multidisciplinary and interdisciplinary as well as cross-sectoral European Training Network aiming to generate and promote 15 highly skilled scientists in the field of the removal of pollutants present in very small amount in aqueous systems.

In order to develop innovative purification technologies expected to be more effective than conventional adsorption and biological treatments, AQUALity enrolled 15 Early-Stage Researchers (ESRs) to conduct cutting-edge research on multidisciplinary aspects of novel hybrid technologies for the removal of Contaminants of Emerging Concern (CECs), which comprehend compounds present in very small amount in aqueous systems, having the potential to cause adverse ecological or human health effects.

AQUALity is a project funded by the European Union under the Marie Skłodowska-Curie Actions (MSCA) – Innovative Training Networks (Call: H2020-MSCA-ITN-2017). Project N. 765860



The 15 ESRs will be trained to develop their creativity, critical and autonomous thinking, and entrepreneurial skills, thus boosting their scientific skills and innovation capacity in the field of water treatment technologies. This goal will be attained via structured training through a research programme, consisting of original individual research projects (performed both at the beneficiary organisation and through intersectoral secondments) and education on technical and transferable skills (performed both at local level and with network-wide events).

AQUALity is a consortium of eighteen partners. The consortium comprises 7 universities, 3 research institutes and 8 companies with a balanced participation of beneficiaries and partner organizations, academic and non-academic.

Each research project addresses a specific issue tailored towards a PhD, and each has been peer-reviewed by the network for scientific rigor and feasibility as a PhD project.

Kick-off meeting

On 25th October 2017, the coordinator Prof. Paola Calza welcomed the participants and officially launched the start of AQUALity project. Then the first session was devoted to the presentation of Partners & Beneficiaries, whereas in the second session WPs objectives, tasks, deliverables and milestones to submit during the first year of the project were listed and the manager structure of the project was defined. Successively, each WP leader presented the activities to be carried out and the planning of the main training events & conferences to be organized in the next two years of the project was discussed.



1



AQUALity

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860



N. 1 (MAY 2018)

AQUALITY NEWSLETTER

Workshop on PhD supervision

The kick-off meeting was preceded by a Course held by Dr. Pia Bogelund, from the Aalborg UNESCO Centre for Problem Based Learning in Engineering Science and Sustainability. During the two-days course (October 23-24, 2017) the following themes were developed by the participants:

- Values and strategies as supervisor. Cross-cultural supervision
- Legitimacy and independence of the PhD students
- Motivation and abandonment of the PhD student. Effective meetings and text feedback
- Different approaches to conflicts

First AQUALity symposium

The symposium was opened by Prof. P. Calza, who welcomed the new enrolled ESRs and updated the participants about the problems relative to the management of the project, next deliverables, milestones and financial rules. In the second session, Dr. I. Oller gave full details about the ESRs recruitment status and the training events to be planned. The third session of the meeting was dedicated to brief presentations of the ESRs' projects and Prof. P. Calza presented the CV of the ESRs who did not partake the event. After lunch, parallel sections were organized to let participants plan the research activities to be carried out. A final common section for discussing WP2, WP3 and WP4 planned activities ended the day.

The second day was opened by Prof. E. Robotti, who gave an overview on the planned secondments, research and training plans. The second session was chaired by Dr. E. Sannino who gave a presentation on the dissemination and outreach activities of the project. The second part of the morning was dedicated to parallel sessions: the meeting of the Joint Governing Structure delegates, the election of the ESRs representatives in the Supervisory Board, and the Supervisory Board meeting. The Symposium ends with a final common section for planning the next project meetings: 2nd AQUALity meeting and Summer School (Aalborg, August 2018) and 3rd AQUALity meeting (Paris, March 2019).

Summer school on Photochemistry and Depollution

The School held from 25th to 27th April 2018 in the premises of the University Clermont-Auvergne at Clermont-Ferrand (France). It was organized by the Photochemistry team of Chemical Institute of Clermont-Ferrand (ICCF) under the supervision of Claire Richard. This event aimed to update recent advances in the field of photochemistry applied to micropollutants removal. The first day was devoted to fundamental photochemistry. It started by the lecture of Dr. Maria Luisa Marin, followed by two presentations on contaminants photo-transformation and on quantum calculations as a tool to study photochemical reactions. The second day dealt with the role of natural organic matter in the fate of micropollutants with the lecture of Prof. Gudrun Abbt-Braun on natural organic characterization, and presentations on their photochemistry and a



review on analytical methods. The working day ended by a visit of the ICCF laboratory. The third day focused on the role of Fe species in the environment and advanced oxidation processes with presentations on the photochemistry of iron complexes and the lecture of Pr Alessandra Bianco Prevot on the case of Hybrid magnetic iron oxides. All the members of the ICCF team ensured the success of this event by their involvement in the scientific program or in the organization.

NEXT EVENTS & ACTIVITIES

International Summer School on
"Micropollutant Analysis and
Abatement"

Aalborg, 27-29 August 2018

&

Second AQUALity symposium

Aalborg, 30-31 August 2018



AALBORG UNIVERSITY



Venue: Aalborg University, CREATE
Building, Rendsburggade 14, 9000
Aalborg (Denmark)

Registration:

The number of participants is limited
to 30. You can register by sending an
e-mail to yb@bio.aau.dk

More information on the Website:

[https://www.aquality-etn.eu/
international-summer-school-on-
micropollutant-analysis-and-
abatement/](https://www.aquality-etn.eu/international-summer-school-on-micropollutant-analysis-and-abatement/)

INFORMATION & NEWS:

Website: www.aquality-etn.eu

Facebook: www.facebook.com/AQUALity/ITN2017

2



AQUALity

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860



NEWSLETTER N.2

N. 2 (NOVEMBER 2018)

AQUALITY NEWSLETTER



PROJECT,
PARTNERS &
BENEFICIARIES



SUMMER SCHOOL AND
SECOND MEETING IN
AALBORG (DK)



ESR EXPERIENCES:
EPISODE ONE



NEXT MEETING:
MARCH 2019



AQUALity

NEWSLETTER

Welcome to the AQUALity newsletter. In this second number you can find the first episode of "ESR Experiences", a column drawn up by the AQUALity young researchers about their career improvements and life paths, together with a short report of the project activities that took place in the second half of 2018 and information about the next events. Enjoy the reading!

International School on "Micropollutant Analysis and Abatement"

The School was organised by the Department of Chemistry and Bioscience (Aalborg University) and Eurofins VBM Laboratoriet and was held on 27-28th August 2018 in Aalborg (DK). The school addressed the new technological advances in the field of analytical chemistry, as well as different techniques for the treatment of contaminated water (advanced oxidation processes and membrane filtration).

Lectures by academic and industrial researchers covered a comprehensive path from the fundamental knowledge to the most advanced technologies for micropollutants analysis and abatement. Students had the opportunity to enlarge their research network and improve their communication skills during working groups.



Pizza Night for the participants to the International School on "Micropollutant Analysis and Abatement"

Seminar on Advanced Water Purification Technologies

On 29th August 2018, a seminar organized jointly by the Department of Chemistry and Bioscience (Aalborg University), Eurofins VBM Laboratoriet, the European Research and Innovation Network MAT4TREAT, Project Ô, and AQUALity was held in Aalborg. During the event, several innovative methods and technologies about water purification were shown and discussed. Many people involved in the AQUALity project and other experts in the field had the opportunity to present their work and their proposal about the removal of pollutants from industrial, urban and drinking water.

The AQUALity project

- AQUALity is a project funded by the European Union under the Marie Skłodowska-Curie Actions (MSCA) – Innovative Training Networks (Call: H2020-MSCA-ITN-2017). Project N. 765860
- AQUALity is a multidisciplinary European Training Network aiming to generate and promote 15 highly skilled scientists in the field of the removal of pollutants present in very small amount in aqueous systems.
- Info: www.aquality-etn.eu/the-project/

1



AQUALity

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860



The AQUALity consortium

- 7 universities:
 - Università di Torino, Italy
 - Aalborg Universitet, Denmark
 - Università del Piemonte Orientale, Italy
 - Universitat Politècnica De Valencia, Spain
 - Panepistimio Ioanninon, Greece
 - Ecole Polytechnique, France
 - Karadeniz Teknik Üniversitesi, Turkey
 - 8 companies:
 - Liqtech International A/S, Denmark
 - Società Metropolitana Acque Torino, Italy
 - IRIS, Italy
 - FACSA, Spain
 - ISALIT, Italy
 - MIRTEC, Greece
 - NIVA, Norway
 - VBM, Denmark
 - 3 research institutes:
 - CNRS Clermont-Ferrand, France
 - Plataforma Solar De Almería, Spain
 - INERIS, France
- Info: www.aquality-etn.eu/who-we-are/

Second AQUALity meeting (Aalborg)

On 30th August 2018, prof. Peter Roslev welcomed the participants on behalf of the local organizers and the Director Department of Chemistry and Bioscience (Aalborg Universitet).

Then, the coordinator - prof. Paola Calza - welcomed the ESRs who recently joined the project, drew the participants' attention on the recent news about the project management and stressed the high relevance of the Mid-Term Check to be held on next March during the 3rd AQUALity meeting. Moreover, she remembered that the participation to the Mid-Term Check is mandatory for the supervisors, the representatives of the partner organizations and all the scientists-in-charge.



Soon after, WPs 2-4 presentations and discussions followed. All the ESRs presented their work and each WP leader (proff. V. Sakkas, A. Arques, V. Boffa) presented the state of the art and the activities to be carried out. In the evening the whole group met at the Restaurant for a networking event.



AQUALity people never stop discussing the project...

In the morning of 31st August, the sessions about WPs 5-7 took place. Prof. I. Oller made a brief summary about the elaboration of the personal and career development plans for all ESRs and resumed the status of the training activities. Prof. E. Robotti resumed the status of the secondments and reminded the audience about some rules concerning the secondment plans and the AQUALity Assessment questionnaires for ESRs and tutors. Prof. E. Laurenti gave a presentation on the status of dissemination and outreach activities inviting all the participants to update the information - to be sent periodically to the coordinator, the Dissemination Manager and the Public Relation Team for the project's archive and the website.

The Supervisory Board Meeting followed. It was chaired by prof. Paola Calza and the following issues were discussed: rules to be followed before publishing a scientific result and the plan of secondments. A final section took place to give the audience updates about the next events and, in conclusion, prof. P. Calza closed the meeting.

ESR Experiences - Episode One

Starting from this number, some of our ESRs will talk about their work and life in a far away country. Thanks to Reni, Kate and Dennis for being the first to tell us about their experiences, may the force always be with you...

N. 2 (NOVEMBER 2018)

AQUALITY NEWSLETTER

Reni Dimitrova

I started my education abroad when I turned 18. Living in a foreign country gave me the opportunity to work and study with lots of people from different places in a fast moving cultural environment, which I believe made me more creative, flexible and open minded person. After finishing my studies in Germany, I decided to continue

my career in one of the most demanding industries, namely the Metallurgy in my home country Bulgaria. After gaining valuable experience in the industry sector, I decided to carry on with my research career abroad. For me personally being able to be in such diverse roles in my professional life keeps me passionate about my work, which I truly believe is a key ingredient for a satisfying work life. It is worth mentioning that constantly changing the environment comes with a big price tag, literally and metaphorically. The lack of meaningful social experience and the effort of building new friendships can drain one's emotional energy. Nevertheless, living far away had taught me to appreciate my family and friends a lot more and to enjoy every minute I spend with them to the fullest.



Reni's presentation in Aalborg meeting

Katarzyna Janowska

My travelling experience as an early stage researcher of AQUALITY project started just after less than 2 months of staying at my host institution Aalborg University. My first travel to Summer School and first AQUALITY meeting in Clermont Ferrand in France was then continued to Turin in Italy. During 3 months secondment at UNITO and IRIS (May-July 2018) I was always on a way, travelling across the country and also abroad for example go to Summer School in Enschede in Netherlands.

I would like to share with you a little piece of this cake. Imagine that you are one of us as PhD student working abroad. You just checked-in all your heavy suitcases and full of uncertainty you are running through airport to catch next flight for your mystery tour. Are you scary? No worries, soon you will become an expert in finding the best connections, ticket prices, easily changing planes few times during few hours. It happened with me. Full of curiosity and doubts how will be your new few months home? You are lost in the middle of all



Kate in the SMAT lab (Turin)

Miss Janowska studied Chemical Engineering at Poznan University of Technology. During her Bachelor and Master degree she was working on chitin in the field of nanostructured biomaterials.



Goodbye party before leaving Turin (from the left: Dimitra, Fabrício, Kate, Esra and Nuno)

unknown places and people. You can be fascinated or disappointed, better if it will be first option. But even if not, anyway you will soon walk confidently through the city, being a guide for your friends, describing each corner and taking photos of next amazing view. You may have problems to find a good place to live, which was a nightmare for me. Maybe you will be surprised with many things in your new country, don't understand Italian expressiveness and language, but for sure there will be always a small light in tunnel people.

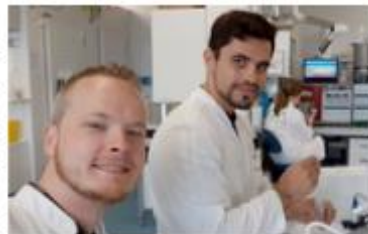
Support of your tutor (thanks to prof. Giuliana Magnacca) and helpful hands of your friends (many thanks to Dimitra, Nuno, Esra and Fabrício) will set you up and clear the sky in worst moments. Summarizing, you will get a lot of experience seeing all new places and meeting all new people. So just enjoy these opportunities!

N. 2 (NOVEMBER 2018)

AQUALITY NEWSLETTER

Dennis Deemter

Living abroad offers many opportunities you would never find when staying at home in the country or city you have been born in. I started my adventures abroad when I decided to do a double degree in Mechanical Engineer with Polymer Technics in Osnabrück, Germany. A dream coming true from a young age. Although at first the cultural differences may not seem to be that big, they are there and you have to adapt to them. It was here I discovered my appreciation of helping other people coming with equal or bigger differences, easing their transition to enjoy our experience together in our new living environment.



Dennis and Fabrício at AAU (Aalborg)

During my Erasmus abroad in Cluj Napoca, Romania I decided I wanted to do a PhD and what would have been fitting better than a Marie Curie program!? I was fortunate to receive a position at the Plataforma Solar de Almería in Andalucía, Southern Spain.

Once arrived in my new home country and starting to work at my new workplace, I felt directly at home between the people I work with. Everyone at the institute has the same goal: not only finishing their PhDs, but foremost making the world a better place with their researches in the Environmental and Water Treatment field.

Mr. Deemter received Bachelors in the double degree programme at Windesheim University of Applied Sciences in Zwolle (NL) and Hochschule Osnabrück (D). He took a Master in Applied Material Sciences with a focus on Polymers and their application on membrane technology.

My Secondments are in Denmark, where I am at the moment in Aalborg, Northern Jutland and in Italy. For me personally, I like to extensively travel the new country I am in and to absorb as much cultural and culinary habits I can. This often results in the discovery of amazing surprises when randomly picking a dish from the menu that is written with words you never have seen before. Or, a terrible dish that can only be appreciated by the local taste pallet.

Concluding all of the above, I can only highly recommend the experience to travel and work abroad. The change to work and surround yourself with so many different personalities, cultures and make connections all over the world is an extreme enrichment of you as a person. While achieving things that you would never considered possible, leaving a better world behind as you found it.

**NEXT EVENTS
& ACTIVITIES**

International Winter School on
Mass Spectrometry
4-5 March 2019

Third AQUALity Meeting
6-7 March 2019

Workshop on substances
prioritization
8 March 2019



Venue: Ecole Polytechnique,
Palaiseau (France)

Information on the Website:
www.aquality-etn.eu/3rd-aquality-meeting/

AQUALity at the Researchers' Night 2018

Last September, our ESR presented their work at the European Researchers' night (in Italy and Spain) and in a Science Festival (in Italy).

**INFORMATION & NEWS:**

Website: www.aquality-etn.eu Facebook: www.facebook.com/AQUALityITN2017

PUBLIC ENGAGEMENT

AQUALity consortium considers very important the bi-directional process involving the public in interaction and listening with the goal of mutual benefit. For these reasons, the ESRs take advantage of all the available events to involve school students and generic public in the consortium activities.

So far the activities were developed in the following main events:

- **Journèe Scientifique 17 July 2018**, Clermont-Ferrand - Davide Palma
- **Expociencia 2018** – Alice Pavanello
- **Researchers' Night 2018**, Università del Piemonte Orientale, Alessandria (Italy) and Universidad Politecnica de Valencia, Valencia (Spain), September 2018- Nuno Gonçalves, Dimitra Papagiannaki, Fabricio Bortot Coehlo, Masho Belay, Ilaria Berruti
- **Festival dell'Innovazione e della Scienza 2018**, Settimo (TO), Italy, October 2018- Dimitra Papagiannaki, Alice Pavanello
- **Ecomondo, The green technology expo**, Rimini (Italy), November 2018 - Masho Belay
- **High school teaching in Universitat Politècnica de València** (Praktikum-lab with 10 students and for 4 days) - Iván Matías Sciscenko
- **Fete de la science 2018**, UCA University - Davide Palma
- **Workshop organized by the Marie Curie Alumni Association**, Sense About Science and Voice of Young Science, “Standing up for science EU” (Barcelona) November 2018- Iván Matías Sciscenko
- **Laboratory with secondary school students, Università del Piemonte Orientale**, Alessandria (Italy), February 2019- Ilaria Berruti, Masho Belay
- **AQUALity Lab**, Università degli Studi di Torino, Torino (Italy), February 2019- Ilaria Berruti, Masho Belay, Nuno Gonçalves, Dimitra Papagiannaki, Fabricio Bortot Coehlo, Katarzyna Janowska

17
JUILLET
9H À 17H
SAVE THE DATE

J⁸O²¹urnée Scientifique

DE L'ÉCOLE DOCTORALE
DES SCIENCES FONDAMENTALES

Fotos: Miguel Lorenzo

EXPOCIÈNCIA 2018

10 ANYS DESCOBRINT EL PARC CIENTÍFIC

DISSABTE 26 DE MAIG
DE 10:00 A 14:00H



RESEARCHERS NIGHT 2018

Alessandria (Italy)



RESEARCHERS NIGHT 2018

Almería (Spain)



FESTIVAL DELL'INNOVAZIONE E DELLA SCIENZA 2018

Settimo t.se (Italy)





Standing up for Science EU 30th November 2018

Institute for Research in Biomedicine, Carrer de Baldri Reixac 10, 08028 Barcelona



ECOMONDO, THE GREEN TECHNOLOGY EXPO Rimini (Italy)



AQUALITY LAB AT HIGH SCHOOL Alessandria (Italy)



AQUALITY LAB

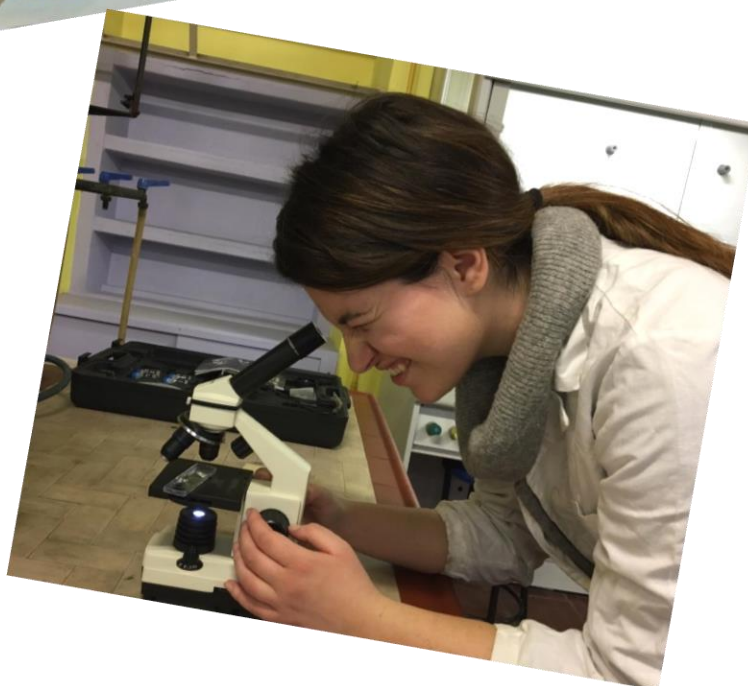
Torino (Italy)



AQUALITY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860







DISSEMINATION

AQUALity ESRs were involved in the dissemination activities listed below:

7 research papers accepted and/or submitted for publication in peer-reviewed international journals

- 1) Maria Cristina Paganini, Alice Giorgini, **Nuno P.F. Gonçalves**, Chiara Gionco, Alessandra Bianco Prevot, Paola Calza "New insight into zinc oxide doped with iron and its exploitation to pollutants abatement", *Catalysis Today*, <https://doi.org/10.1016/j.cattod.2018.10.054>
- 2) **Palma, Davide**; Prevot, A. B.; Celi, L.; Martin, M.; Fabbri, D.; Magnacca, G.; Chierotti, M.; Nisticò R.; "Isolation, Characterization, and Environmental Application of Bio-Based Materials as Auxiliaries in Photocatalytic Processes", *Catalysts* 2018, 8 (5), 197
- 3) **Palma, Davide**; Prevot, A. B.; Brigante, M.; Fabbri, D.; Magnacca, G.; Richard, C.; Mailhot, G.; Nisticò, R. "New Insights on the Photodegradation of Caffeine in the Presence of Bio-Based Substances-Magnetic Iron Oxide Hybrid Nanomaterials", *Materials*, 2018 Jul; 11(7): 1084
- 4) Rita Binetti, Paola Calza, Giovanni Costantino, Stefania Morgillo, **Dimitra Papagiannaki**, "Perfluoroalkyl Substances Assessment in Turin Metropolitan Area and correlation with potential sources of pollution according to the Water Safety Plan risk management approach", *Separations* under the Special Issue "Determination of Contaminants of Emerging Concern in Environmental Matrices", accepted
- 5) **Nuno P.F. Gonçalves**, Maria Cristina Paganini, Erik Cerrato, Paola Calza, "The effect of cobalt doping on the efficiency of ZnO in the photocatalytic water remediation", *Catalysts*, submitted
- 6) **Nuno P.F. Gonçalves**, Marco Minella, Debora Fabbri, Paola Calza, Cosimino Malitesta, Elisabetta Mazzotta, Alessandra Bianco Prevot, "Humic acid coated magnetic nanoparticles as highly efficient heterogeneous photo-Fenton materials for Water treatments", *Journal of Hazardous Materials*, submitted
- 7) **Fabricio Eduardo Bortot Coelho**, Chiara Gionco, Maria Cristina Paganini, Paola Calza, Giuliana Magnacca, "Control of membrane fouling in organics filtration using Ce-doped zirconia and visible light", *Nanomaterials* under the special issue "Sustainable and Safe Nano-Enabled Water Treatment Applications", submitted

8 posters at international congresses

- 1) **Dimitra Papagiannaki**, F. Barsotti, A. Salaris, M. Fingi, R. Binetti, "Fate of Metolachlor and Terbutylazine in surface water and related drinking water treatment plant", *XENOWAC II "Challenges and Solutions related to Xenobiotics and Antimicrobial Resistance in the Framework of Urban Wastewater Reuse: Towards a Blue Circle Society" conference*, poster communication
- 2) **Iliaria Berruti**, M.I. Polo-Lopez, I. Oller, M. Manfredi, "Assessment of novel advanced oxidation processes for removal of disinfection by-products and CECs from drinking water" 10th European Meeting on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA10), poster communication
- 3) C. Gionco, **Fabricio Eduardo Bortot Coelho**, G. Magnacca, D. Fabbri, M. Cerruti, P. Calza, M.C. Paganini, "Development of oxides doped with transition metals and its exploitation to pollutants abatements", 10th European meeting on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA10), poster communication
- 4) **Dennis Deemter**, I. Oller, S. Malato, A. Amat, "Application of Advanced Integrated Technologies (Membrane and Photo-Oxidation Processes) for the Removal of CECs contained in Urban

- Wastewater”, 10th European meeting on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA10), poster communication
- 5) **Katarzyna Janowska**, **Fab rio E. Bortot Coelho**, Francesca Deganello, Giuliana Magnacca, Vittorio Boffa, "Catalytic activity of doped SrFeO_{3- } perovskite-type oxide ceramics for degradation of water pollutants", 2nd Nordic Conference on Ceramic and Glass Technology at Technical University of Denmark (DTU), poster presentation
 - 6) **Esra Eray**, Victor M. Candelario Leal, Giuliana Magnacca, Jan Hoffmann Jorgensen, "Ceramic Processing of Silicon Carbide Ultrafiltration Membranes Reducing Sintering Temperature by Using Aluminium Salts", 2nd Nordic Conference on Ceramic and Glass Technology at Technical University of Denmark (DTU), poster communication
 - 7) **Fab rio E. Bortot Coelho**, Chiara Gionco, Maria Cristina Paganini, Giuliana Magnacca, "Ce-ZrO₂ Photocatalyst for the Degradation of Humic Substances Under Visible Light ", International Winter School in "Innovative Catalysis and Sustainability", poster communication
 - 8) A. Giorgini, **Nuno P.F. Gon alves**, C. Gionco, A. Bianco Prevot, M.C. Paganini, "Development of oxides doped with transition metals and its exploitation to pollutants abatements", 10th European meeting on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA10)

6 oral communications at international congresses

- 1) **Davide Palma**, O. Voldoire, A. Beauger, M. Sleiman, C. Richard, "Photodegrading properties of natural waters sampled in a stagnant branch of river Allier", Meeting of the French IHSS (International Humic Substances Society)
 - 2) **Nuno P.F. Gon alves**, Marco Minella, Debora Fabbri, Paola Calza, Alessandra Bianco Prevot, "Humic Acid Coated Magnetic Nanoparticles as Highly Efficient Heterogeneous Photo-Fenton Materials for Wastewater", 19th European Meeting on Environmental Chemistry
 - 3) **Davide Palma**, "Evidence of nitration and nitrosation of aromatic compounds upon irradiation of imidacloprid in water", EMEC 19 (European Meeting on Environmental Chemistry)
 - 4) E. Nicol, Y. Xu, **Zsuzsanna Varga**, R. Grosshaus, S. Bouchonnet, M. Lavielle, "A new software for the statistical treatment of high resolution mass spectra", Symposium of the Federation of Chemistry and Physics of Paris-Saclay
 - 5) **Zsuzsanna Varga**, "A new software for the statistical treatment of high resolution mass spectra", Presentation of the software for industry
 - 6) **Zsuzsanna Varga**, "A new software for the statistical treatment of high resolution mass spectra - Application to water contaminants", 19th European Meeting on Environmental Chemistry (EMEC 19)
- **Katarzyna Janowska and Esra Eray won the first and third prize poster awards** at the 2nd Nordic Conference on Ceramic and Glass Technology
 - **Davide Palma received the prize as best oral presentation among young researchers at the 19th European Meeting on Environmental Chemistry.**

THE FRENCH IHSS (INTERNATIONAL HUMIC SUBSTANCES SOCIETY)

Marseille (France)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860.

Photodegrading properties of natural waters sampled in a stagnant branch of river Allier

Davide Palma¹, Olivier Voldoire², Aude Beauger², Mohamad Sleiman¹, Claire Richard¹

¹Université Clermont Auvergne, CNRS, Sigma-Clermont, Institut de Chimie de Clermont-Ferrand, F-63000 Clermont-Ferrand, France

²Geolab, F-63000 Clermont-Ferrand, France



Journée IHSS France - Marseille - 14 Septembre 2018



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860.

AQUALITY International Training Network project gathering:

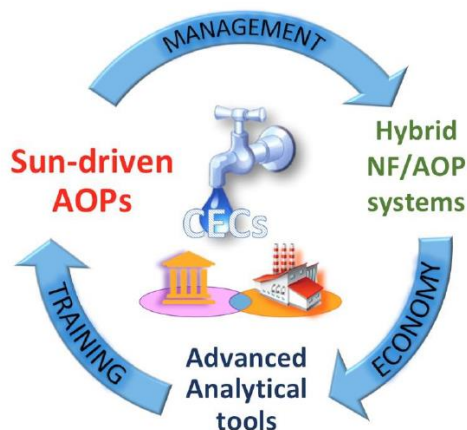
- 8 academic laboratories european countries
- 2 non-academic laboratories
- 7 small industries



15 PhD students enrolled


Goal of the project:

“Interdisciplinary cross-sectoral approach to effectively address the removal of contaminants of emerging concern from water”




Journée IHSS France - Marseille - 14 Septembre 2018

SYMPOSIUM OF THE FEDERATION OF CHEMISTRY AND PHYSICS OF PARIS-SACLAY (CPPS 2018) Palaiseau (France)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860



Un nouveau logiciel pour le traitement statistique de spectres de masse haute résolution

Edith nicol¹, yao xu², zsuzsanna varga¹, rose grosshans¹, stéphane bouchonnet¹, marc lavielle²

1. Laboratoire de chimie moléculaire
2. Laboratoire de mathématiques appliquées
Ecole polytechnique 91128 palaiseau

19th EUROPEAN MEETING ON ENVIRONMENTAL CHEMISTRY

Royat (France)

Humic Acid Coated Magnetic Nanoparticles as Highly Efficient Heterogeneous Photo-Fenton Materials for Wastewater Treatments

ORAL
(Sustainable chemistry)

Nuno P.F. Gonçalves*, Marco Minella, Debora Fabbri, Paola Calza, Alessandra Bianco Prevot. Department of Chemistry, Università di Torino, Torino, Italy; *nunopaulo.ferreiragoncalves@unito.it.

Contaminants of emerging concern (CECs), including pharmaceuticals and personal care products, are increasingly being detected at low levels in surface water, and there is concern that these compounds may have an impact on aquatic life. Despite their low concentration, several CECs are a major health concern due to their toxicity [1]. Due to their incomplete removal in the traditional wastewater treatment plants, considerable efforts have been devoted to develop suitable purification methods capable to destroy these bio-recalcitrant organic contaminants. For this purpose, Advanced oxidation processes (AOPs) have been developed, since they are extremely efficient in the degradation/mineralization of a wide range of organic contaminants, including several CECs,

is still not fully solved [4]. Additionally, in order to avoid the complete oxidation of magnetite/maghemite phases to hematite, the stabilization with an organic coating is usually carried out.

In this study, humic acid coated Fe₃O₄ magnetic nanoparticles (Fe₃O₄/HA) were prepared by co-precipitation method under controlled conditions using different amounts of humic acid, both in anoxic and oxygenated conditions. The Fe₃O₄/HA materials were tested in aqueous media using 4-chlorophenol (4CP) at different pH, in the presence of H₂O₂, in the dark and under sun-light irradiation. The very efficient process for 4CP degradation (0.2 mM) (used as a model pollutant) was evidenced by the complete abatement in less



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement N. 765860.



Humic Acid Coated Magnetic Nanoparticles as Highly Efficient Heterogeneous Photo-Fenton Materials for Wastewater Treatments

Nuno Gonçalves

Università degli Studi di Torino, Italy

Acknowledgements

19th European Meeting on Environ

Prof. Alessandra Bianco Prevot
Prof. Paola Calza
Dr. Marco Minella
Dr. Debora Fabbri



AQUALity is a project funded by the European Union under the Marie Skłodowska-Curie Actions (MSCA) – Innovative Training Networks (Call: H2020-MSCA-ITN-2017; Project N. 765860)

Website www.aquality.etn-eu

Facebook www.facebook.com/AQUALityITN2017

2



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765860



19th EUROPEAN MEETING ON ENVIRONMENTAL CHEMISTRY Royat (France)



19th EUROPEAN MEETING ON ENVIRONMENTAL CHEMISTRY

Royat (France)



XENOWAC II Limassol (Cyprus)

Fate of Metolachlor and Terbutylazine in Surface Water and Related Drinking Water Treatment Plants

D. Papagiannaki¹, F. Barsotti¹, A. Salaris¹, M. Fungi¹, R. Binetti¹
¹Società Metropolitana Acque Torino S.p.A. – Research Center, Corso Unità d'Italia 235/3 – Torino (Italy)

Introduction

Although herbicides have improved the quality of life through the growth of various crops, their misuse can cause serious environmental pollution.

More specifically they can contaminate the soil, the surface and underground water being in this way a serious threat to the life on earth. For this reason, the management of the whole water cycle (from production to distribution) must carefully monitor the presence of these compounds in both surface and underground water used for drinking water production and along the treatment plants (both the Italian and European Union laws for drinking water is 0.1 µg/L for single herbicides). Contaminants can be found in raw water, in the original molecules structure, but also as metabolites resulting from different chemical, photochemical and biological transformations that naturally occur in the waterway.

Experimental setup

Raw river water samples taken after each step of the treatment flow and synthetic solution samples (the batch oxidation experiments) were analysed using High Performance Liquid Chromatography (HPLC) with a Triple Quadrupole Mass Spectrometer (LC-MS/MS).

Mobile phase: mixture of 5 mM Ammonium Acetate in Water (A) and 5 mM Ammonium Acetate in Methanol (B) (gradient analysis).

Injection Volume: 20 µL.

Spectra were acquired in MS/MS and Full Scan mode.

Electrospray ionization in negative and positive mode.

Limit of Quantification for every compound: 5 ng/L.

Batch oxidation experiments for the evaluation of the parent compounds' degradation and the detection of their transformation products were carried out using water treatment plant.

an initial contaminants concentration of about 100 µg/L.

an oxidation time for batch experiments of 4 hours, after defined specific time intervals (0, 15, 135, 120, 140, 160, 190, 125, 150, 180, 210, 240) samples were taken and analysed, in real water treatment plant oxidation time is of about 18 minutes.

According to the degradation pathways of Terbutylazine and Metolachlor found in the literature the attention was focused on these metabolites:

Metolachlor

- 80% concentration reduction after 4 hours of oxidation treatment
- Transformation products detected:
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
- They are results of a substitution of chlorine in the structure of Metolachlor followed by an oxidation step and a loss of carbon chain (4).
- The maximum concentration of transformation products revealed was 7 ng/L.

Terbutylazine

- 80% concentration reduction after 4 hours of oxidation treatment
- Transformation products detected:
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
- They are results of a substitution of chlorine in the structure of Terbutylazine followed by an oxidation step and a loss of carbon chain (4).
- The maximum concentration of transformation products revealed was 7 ng/L.

Conclusion

In real water samples, Metolachlor (0.1 µg/L) and Terbutylazine (0.15 µg/L) are occasionally detected in river water at the intake of the drinking water treatment plant. According to the batch oxidation experiments, 40% of Metolachlor and Terbutylazine are degraded by the same oxidation step of the real drinking water treatment plant. The presence of the real water samples analysed, 40% of Metolachlor and Terbutylazine are degraded by the same oxidation step of the real drinking water treatment plant. The presence of the real water samples analysed, 40% of Metolachlor and Terbutylazine are degraded by the same oxidation step of the real drinking water treatment plant. The presence of the real water samples analysed, 40% of Metolachlor and Terbutylazine are degraded by the same oxidation step of the real drinking water treatment plant.

In-Situ Monitoring of Waste Water using Autonomous Sensing Platform

Andrew Donohoe, Margaret McHugh, Dermot Duggan
Dublin City University, Dublin 9, Ireland

Metals such as Phosphate, Ammonia, Nitrate and Nitrite are central to animal metabolic processes. The nutrient platform is based on a low cost, low cost (LED based) optical detector and wireless communication technology to enable the ability before being integrated to form a working pre-commercial platform.

Rapid Prototyping

A series of Rapid Prototyping (RP) chips is integrated on a platform. The chip is a two layer and one is a thin layer of silicon for making a optical detector with photodiode.

Microfluidics

A two-layer PDMS chip is integrated on a platform. The chip is a two layer and one is a thin layer of silicon for making a optical detector with photodiode.

Fate of Metolachlor and Terbutylazine in Surface Water and Related Drinking Water Treatment Plants

D. Papagiannaki¹, F. Barsotti¹, A. Salaris¹, M. Fungi¹, R. Binetti¹
¹Società Metropolitana Acque Torino S.p.A. – Research Center, Corso Unità d'Italia 235/3 – Torino (Italy)

Introduction

Although herbicides have improved the quality of life through the growth of various crops, their misuse can cause serious environmental pollution.

More specifically they can contaminate the soil, the surface and underground water being in this way a serious threat to the life on earth. For this reason, the management of the whole water cycle (from production to distribution) must carefully monitor the presence of these compounds in both surface and underground water used for drinking water production and along the treatment plants (both the Italian and European Union laws for drinking water is 0.1 µg/L for single herbicides). Contaminants can be found in raw water, in the original molecules structure, but also as metabolites resulting from different chemical, photochemical and biological transformations that naturally occur in the waterway.

Experimental setup

Raw river water samples taken after each step of the treatment flow and synthetic solution samples (the batch oxidation experiments) were analysed using High Performance Liquid Chromatography (HPLC) with a Triple Quadrupole Mass Spectrometer (LC-MS/MS).

Mobile phase: mixture of 5 mM Ammonium Acetate in Water (A) and 5 mM Ammonium Acetate in Methanol (B) (gradient analysis).

Injection Volume: 20 µL.

Spectra were acquired in MS/MS and Full Scan mode.

Electrospray ionization in negative and positive mode.

Limit of Quantification for every compound: 5 ng/L.

Batch oxidation experiments for the evaluation of the parent compounds' degradation and the detection of their transformation products were carried out using water treatment plant.

an initial contaminants concentration of about 100 µg/L.

an oxidation time for batch experiments of 4 hours, after defined specific time intervals (0, 15, 135, 120, 140, 160, 190, 125, 150, 180, 210, 240) samples were taken and analysed, in real water treatment plant oxidation time is of about 18 minutes.

According to the degradation pathways of Terbutylazine and Metolachlor found in the literature the attention was focused on these metabolites:

Metolachlor

- 80% concentration reduction after 4 hours of oxidation treatment
- Transformation products detected:
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
- They are results of a substitution of chlorine in the structure of Metolachlor followed by an oxidation step and a loss of carbon chain (4).
- The maximum concentration of transformation products revealed was 7 ng/L.

Terbutylazine

- 80% concentration reduction after 4 hours of oxidation treatment
- Transformation products detected:
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
 - 2-(2-chloro-4-ethyl-6-methylphenyl)aminoacetic acid
- They are results of a substitution of chlorine in the structure of Terbutylazine followed by an oxidation step and a loss of carbon chain (4).
- The maximum concentration of transformation products revealed was 7 ng/L.

Conclusion

In real water samples, Metolachlor (0.1 µg/L) and Terbutylazine (0.15 µg/L) are occasionally detected in river water at the intake of the drinking water treatment plant. According to the batch experiment findings in the real water samples analysed, 40% of Metolachlor and Terbutylazine are degraded by the same oxidation step of the real drinking water treatment plant. The presence of the real water samples analysed, 40% of Metolachlor and Terbutylazine are degraded by the same oxidation step of the real drinking water treatment plant. The presence of the real water samples analysed, 40% of Metolachlor and Terbutylazine are degraded by the same oxidation step of the real drinking water treatment plant.

In-Situ Monitoring of Waste Water using Autonomous Sensing Platform

Andrew Donohoe, Margaret McHugh, Dermot Duggan
Dublin City University, Dublin 9, Ireland

Metals such as Phosphate, Ammonia, Nitrate and Nitrite are central to animal metabolic processes. The nutrient platform is based on a low cost, low cost (LED based) optical detector and wireless communication technology to enable the ability before being integrated to form a working pre-commercial platform.

Rapid Prototyping

A series of Rapid Prototyping (RP) chips is integrated on a platform. The chip is a two layer and one is a thin layer of silicon for making a optical detector with photodiode.

Microfluidics

A two-layer PDMS chip is integrated on a platform. The chip is a two layer and one is a thin layer of silicon for making a optical detector with photodiode.

SPEA10-Almeria (Spain)

Metal oxide photocatalysts supported on reduced graphene oxide self-standing structures: a new perspective for wastewater treatment

Chao Guo¹, Fabrice-Eduardo Bortol Castro¹, Glauco Magrinha², Debora Fabre¹,
Marta Cerrut¹, Piedad Cede¹, Maria Cristina Pajonir¹
Email: glauco.magrinha@univ-lyon.fr
(1) Department of Chemistry, University of Lyon, France, 69622
(2) McGill University Montreal, Canada

Abstract: Heterogeneous photocatalysis plays a fundamental role in the degradation processes of pollutants, organic molecules present in environmental matrices through advanced oxidation processes (AOPs). However, in the last decades, many researchers focused their work on the development of heterogeneous catalytic systems in the purification of water, a practical and independent issue. Metal oxides have a broad spectrum of photocatalytic activity and are widely used in water treatment. In this work, we have developed a new type of photocatalytic material, a reduced graphene oxide (rGO) self-standing structure, which has a high surface area and a good light absorption. The use of rGO as a support for metal oxides allows to improve the photocatalytic activity of the metal oxides and to avoid the leaching of the metal ions into the water. The results show that the rGO self-standing structures are a promising material for wastewater treatment.

Photocatalysis: The photocatalytic activity of the prepared samples was tested, showing the degradation of a textile dye (Methyl Orange, MO) and a dye of high molecular weight (Fig. 1).

All the materials were able to enhance the degradation of the dye, showing the photocatalytic activity of the reduced graphene oxide, indicating that the reduced graphene oxide does not prevent the photocatalysis to absorb light and form reactive highly oxidative species.

Materials synthesis: Samples were prepared through a simple and green hydrothermal method (1).

Materials characterization: The morphology of the samples was measured through a SEM analysis.

The SEM images reported in Fig. 2 show clearly that the self-standing structure of the reduced graphene oxide (rGO) sheets, the metal oxides, well observed in the SEM images, allowing to improve photocatalysis. The experimental parameters for the synthesis of the self-standing structures are given in Table 1.

The SEM images of the samples are shown in Fig. 3. The images show that the self-standing structure of the reduced graphene oxide (rGO) sheets, the metal oxides, well observed in the SEM images, allowing to improve photocatalysis. The experimental parameters for the synthesis of the self-standing structures are given in Table 1.

References:

1. Guo, C.; Bortol Castro, F.E.; Magrinha, G.; Fabre, D.; Cerrut, M.; Cede, P.; Pajonir, M.C. *Chemical Communications* 2018, 1-3.

AQUALITY

SPEA10-Almeria (Spain)

Integrated Technologies (Membrane Processes) for the Removal of CECs from Urban Wastewater

M. Amat¹ Affiliation: (1) Plataforma Solar de Almería-CICMAt, Carretera de Almería Avanzada, Campus de Almería, Universidad Politécnica de Valencia, Spain

SPEA10

The AQUA

References

Figure 1: Cycle of water treatment in water reuse

Introduction

The availability and the provision of safe drinking water is now globally one of the most serious challenges facing the planet. It is a solution to increase the water availability for several uses can be the use of storage treatment plants efficiency for drinking water. It has been proved and included into an environmental buffer. The subject to carry out a more exhaustive control in the operation of existing treatment plants in order to be the quality standards used in water reclamation policies and guidelines. Attention must be paid to microbiological parameters and micropollutants or Contaminants of Emerging Concern (CECs) that have recently been detected in treated water. These micropollutants are not effectively removed by conventional treatment plants. In surface water bodies, Traditional Disinfectants are only effective in removing harmful microorganisms, but can react with natural organic matter (NOM) and can form disinfection by-products (DBPs). Therefore, the use of alternative disinfection technologies has to be explored and Advanced Oxidation Processes (AOPs), based on the generation of highly reactive hydroxyl radicals ([•]OH), can be an adequate alternative.

Objective

The general aim of this work is to carry out a comparative evaluation of the efficiency of several solar photochemical technologies (AOP) including heterogeneous photocatalysis, solar photo-Fenton and solar $\text{H}_2\text{O}_2/\text{H}_2\text{O}_2$ as water treatment, bearing in the technical innovation, on the possibility of achieving the elimination of CECs and on the removal of disinfection by-products in perspective for water reclamation purposes.

Materials and methods

Standard drinking water technologies:

UV-C pilot plant:
 UV-C lamp (254 nm peak wavelength, 230 W)
 Total volume: 300 L
 Illuminated volume: 5.2 L

Target Pathogens:
 E. coli (ATCC 8739) (E. coli)
 E. coli (ATCC 8739) (E. coli)
 Pseudomonas aeruginosa (ATCC 27812)
 Virus MS2 (ATCC 35861)
 C. parvum (ATCC 35861)

Figure 2: Cycle of water treatment in water reuse

Figure 3: Cycle of water treatment in water reuse

Figure 4: Cycle of water treatment in water reuse

Figure 5: Cycle of water treatment in water reuse

Figure 6: Cycle of water treatment in water reuse

Figure 7: Cycle of water treatment in water reuse

Figure 8: Cycle of water treatment in water reuse

Figure 9: Cycle of water treatment in water reuse

Figure 10: Cycle of water treatment in water reuse

Figure 11: Cycle of water treatment in water reuse

Figure 12: Cycle of water treatment in water reuse

Figure 13: Cycle of water treatment in water reuse

Figure 14: Cycle of water treatment in water reuse

Figure 15: Cycle of water treatment in water reuse

Figure 16: Cycle of water treatment in water reuse

Figure 17: Cycle of water treatment in water reuse

Figure 18: Cycle of water treatment in water reuse

Figure 19: Cycle of water treatment in water reuse

Figure 20: Cycle of water treatment in water reuse

Figure 21: Cycle of water treatment in water reuse

Figure 22: Cycle of water treatment in water reuse

Figure 23: Cycle of water treatment in water reuse

Figure 24: Cycle of water treatment in water reuse

Figure 25: Cycle of water treatment in water reuse

Figure 26: Cycle of water treatment in water reuse

Figure 27: Cycle of water treatment in water reuse

Figure 28: Cycle of water treatment in water reuse

Figure 29: Cycle of water treatment in water reuse

Figure 30: Cycle of water treatment in water reuse

Figure 31: Cycle of water treatment in water reuse

Figure 32: Cycle of water treatment in water reuse

Figure 33: Cycle of water treatment in water reuse

Figure 34: Cycle of water treatment in water reuse

Figure 35: Cycle of water treatment in water reuse

Figure 36: Cycle of water treatment in water reuse

Figure 37: Cycle of water treatment in water reuse

Figure 38: Cycle of water treatment in water reuse

Figure 39: Cycle of water treatment in water reuse

Figure 40: Cycle of water treatment in water reuse

Figure 41: Cycle of water treatment in water reuse

Figure 42: Cycle of water treatment in water reuse

Figure 43: Cycle of water treatment in water reuse

Figure 44: Cycle of water treatment in water reuse

Figure 45: Cycle of water treatment in water reuse

Figure 46: Cycle of water treatment in water reuse

Figure 47: Cycle of water treatment in water reuse

Figure 48: Cycle of water treatment in water reuse

Figure 49: Cycle of water treatment in water reuse

Figure 50: Cycle of water treatment in water reuse

Figure 51: Cycle of water treatment in water reuse

Figure 52: Cycle of water treatment in water reuse

Figure 53: Cycle of water treatment in water reuse

Figure 54: Cycle of water treatment in water reuse

Figure 55: Cycle of water treatment in water reuse

Figure 56: Cycle of water treatment in water reuse

Figure 57: Cycle of water treatment in water reuse

Figure 58: Cycle of water treatment in water reuse

Figure 59: Cycle of water treatment in water reuse

Figure 60: Cycle of water treatment in water reuse

Figure 61: Cycle of water treatment in water reuse

Figure 62: Cycle of water treatment in water reuse

Figure 63: Cycle of water treatment in water reuse

Figure 64: Cycle of water treatment in water reuse

Figure 65: Cycle of water treatment in water reuse

Figure 66: Cycle of water treatment in water reuse

Figure 67: Cycle of water treatment in water reuse

Figure 68: Cycle of water treatment in water reuse

Figure 69: Cycle of water treatment in water reuse

Figure 70: Cycle of water treatment in water reuse

Figure 71: Cycle of water treatment in water reuse

Figure 72: Cycle of water treatment in water reuse

Figure 73: Cycle of water treatment in water reuse

Figure 74: Cycle of water treatment in water reuse

Figure 75: Cycle of water treatment in water reuse

Figure 76: Cycle of water treatment in water reuse

Figure 77: Cycle of water treatment in water reuse

Figure 78: Cycle of water treatment in water reuse

Figure 79: Cycle of water treatment in water reuse

Figure 80: Cycle of water treatment in water reuse

Figure 81: Cycle of water treatment in water reuse

Figure 82: Cycle of water treatment in water reuse

Figure 83: Cycle of water treatment in water reuse

Figure 84: Cycle of water treatment in water reuse

Figure 85: Cycle of water treatment in water reuse

Figure 86: Cycle of water treatment in water reuse

Figure 87: Cycle of water treatment in water reuse

Figure 88: Cycle of water treatment in water reuse

Figure 89: Cycle of water treatment in water reuse

Figure 90: Cycle of water treatment in water reuse

Figure 91: Cycle of water treatment in water reuse

Figure 92: Cycle of water treatment in water reuse

Figure 93: Cycle of water treatment in water reuse

Figure 94: Cycle of water treatment in water reuse

Figure 95: Cycle of water treatment in water reuse

Figure 96: Cycle of water treatment in water reuse

Figure 97: Cycle of water treatment in water reuse

Figure 98: Cycle of water treatment in water reuse

Figure 99: Cycle of water treatment in water reuse

Figure 100: Cycle of water treatment in water reuse

Figure 101: Cycle of water treatment in water reuse

Figure 102: Cycle of water treatment in water reuse

Figure 103: Cycle of water treatment in water reuse

Figure 104: Cycle of water treatment in water reuse

Figure 105: Cycle of water treatment in water reuse

Figure 106: Cycle of water treatment in water reuse

Figure 107: Cycle of water treatment in water reuse

Figure 108: Cycle of water treatment in water reuse

Figure 109: Cycle of water treatment in water reuse

Figure 110: Cycle of water treatment in water reuse

Figure 111: Cycle of water treatment in water reuse

Figure 112: Cycle of water treatment in water reuse

Figure 113: Cycle of water treatment in water reuse

Figure 114: Cycle of water treatment in water reuse

Figure 115: Cycle of water treatment in water reuse

Figure 116: Cycle of water treatment in water reuse

Figure 117: Cycle of water treatment in water reuse

Figure 118: Cycle of water treatment in water reuse

Figure 119: Cycle of water treatment in water reuse

Figure 120: Cycle of water treatment in water reuse

Figure 121: Cycle of water treatment in water reuse

Figure 122: Cycle of water treatment in water reuse

Figure 123: Cycle of water treatment in water reuse

Figure 124: Cycle of water treatment in water reuse

Figure 125: Cycle of water treatment in water reuse

Figure 126: Cycle of water treatment in water reuse

Figure 127: Cycle of water treatment in water reuse

Figure 128: Cycle of water treatment in water reuse

Figure 129: Cycle of water treatment in water reuse

Figure 130: Cycle of water treatment in water reuse

Figure 131: Cycle of water treatment in water reuse

Figure 132: Cycle of water treatment in water reuse

Figure 133: Cycle of water treatment in water reuse

Figure 134: Cycle of water treatment in water reuse

Figure 135: Cycle of water treatment in water reuse

Figure 136: Cycle of water treatment in water reuse

Figure 137: Cycle of water treatment in water reuse

Figure 138: Cycle of water treatment in water reuse

Figure 139: Cycle of water treatment in water reuse

Figure 140: Cycle of water treatment in water reuse

Figure 141: Cycle of water treatment in water reuse

Figure 142: Cycle of water treatment in water reuse

Figure 143: Cycle of water treatment in water reuse

Figure 144: Cycle of water treatment in water reuse

Figure 145: Cycle of water treatment in water reuse

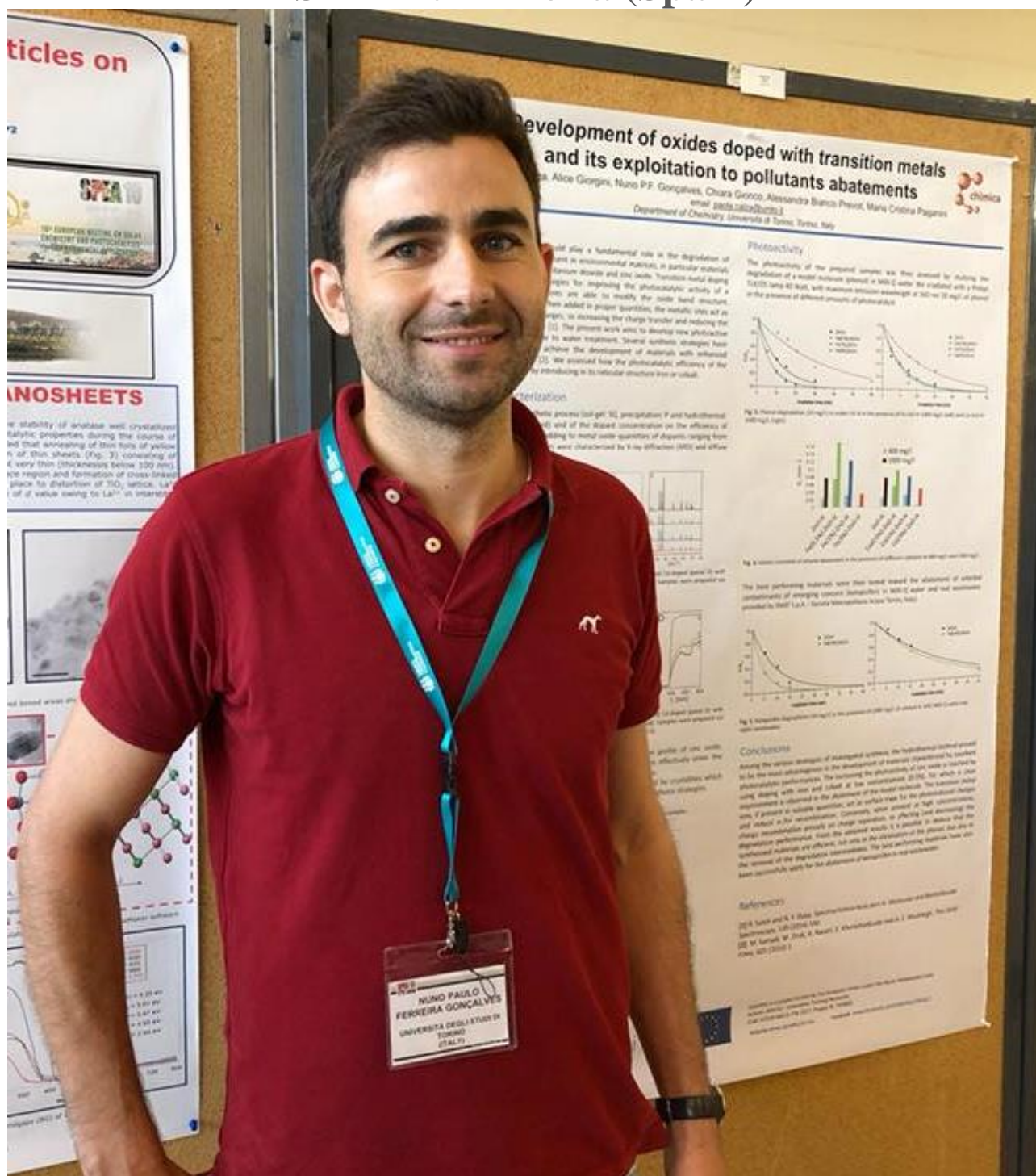
Figure 146: Cycle of water treatment in water reuse

Figure 147: Cycle of water treatment in water reuse

Figure 148: Cycle of water treatment in water reuse

Figure 149: Cycle of water treatment in water reuse

SPEA10-Almeria (Spain)



SPEA10-Almeria (Spain)



2nd NORDIC CONFERENCE ON CERAMIC AND GLASS TECHNOLOGY

Lyngby (Denmark)



2nd NORDIC CONFERENCE ON CERAMIC AND GLASS TECHNOLOGY

Lyngby (Denmark)

