Curriculum Vitae

Personal information

First name(s) / Surname(s) **Alessandra Zanoletti**

Educational qualification

Environmental Engineer, PhD

Work experience

1 January 2019 – today

Postdoctoral Fellow

Chemistry for Technologies Laboratory, Department of Mechanical and Industrial Engineering, University of Brescia.

AZ studies are focused on the reuse and valorisation of industrial by-products. She works on synthesis and characterization of new porous materials for airborne particulate matter (PM) capture, nanostructured catalysts, and on the research of a novel method for heavy metals stabilization based on sewage sludge recovery.

Use of X-Ray Diffraction (XRD), Total Reflection X-Ray Fluorescence (TXRF), Micro X-Ray Fluorescence (μXRF), Ion Chromatography (IC), Optical microscopy, Colorimeter and UV-VIS spectrophotometer.

2015-today

Experience in laboratory activities

Chemistry for Technologies Laboratory, Department of Mechanical and Industrial Engineering, University of Brescia.

AZ has experience in laboratory activities and good technical knowledge of spectroscopy acquired during her work as PhD student and postdoctoral fellow.

12 April 2021-10 September 2021

Teaching support (SSD CHIM/07)

Subject: Spectroscopy laboratory-SSD CHIM/07 (Course of study: MECMLT)

Today

Subject Expert - "Cultore della materia"

AZ is "Cultore della materia" for the following subjects:

Elementi di Chimica – SSD: CHIM/07

Chimica – SSD: CHIM/07

2015 - today

Co-relator of the degree thesis

AZ has tutored graduate and undergraduate students in Mechanical, Environmental and Civil Engineering (33 students)

Today

Guest Editor

Guest editor for Special Issue: "Advanced Waste Technologies for Sustainable Materials and Products" Journal Sustainability, and for Special Issue "Innovative Materials and Techniques for Air Particulate Matter Reduction" Journal Applied Sciences

Today

Review editor

Chemical Treatments, Frontiers in Environmental Chemistry

2018 - 2019

Micropollutants table

Participation in work group on emerging pollutants (GdL-MIE), organized by Lombardy Energy Cleantech Cluster (CL2E)

18 February 2019 – 13 September 2019 **Teaching support (SSD CHIM/07)**
Subject: Chimica-SSD CHIM/07 (Course of study: AMBLT)

1 November 2018 - 31 December 2018 **Scholarship**
Chemistry for Technologies Laboratory, Department of Mechanical and Industrial Engineering, University of Brescia.
Synthesis and characterization of porous materials from waste materials for air particulate matter (PM) capture

4 May - 31 October 2015 **Stage**
Ecogamma srl, via Pila 2 (Viterbo); Responsible: Massimo Celletti
Removal of surfactants from wastewaters by industrial by-products
Use of X-Ray Diffraction (XRD), Total Reflection X-Ray Fluorescence (TXRF), Ion Chromatography (IC), UV-VIS spectrophotometer

Education and training

1 November 2015 - 31 October 2018 **PhD**
PhD student (XXXI Cycle) in Mechanical and Industrial Engineering at University of Brescia
Synthesis and characterization of porous materials from waste materials for air particulate matter (PM) capture.
Use of X-Ray Diffraction (XRD), Total Reflection X-Ray Fluorescence (TXRF), Ion Chromatography (IC), UV-VIS spectrophotometer. Use of Ces Selector Software for materials sustainability analysis.
Thesis title: “A new porous hybrid material to reduce air particulate matter (PM)”

14-18 May/4-8 June 2018 **Research experience at Joint Research Centre (JRC) Ispra**
In the frame of BASALTO project, AZ spent two weeks on JRC laboratories. Morphological and chemical analysis were performed by TEM and SEM.

2015 **State examination in Environmental Engineering**
Sez A: Civil and Environmental Engineer 2015

2012/2013 - 2013/2014 **Master Degree in Environmental Engineering LM 35**
University of Brescia, Environmental Engineering LM 35 (98/110)
Management and control of water and waste treatment, Advanced water and waste treatment, water treatment plant project
Thesis title: “Abbattimento di tensioattivi anionici con l'impiego di materiali di scarto”

2008/2009 - 2011/2012 **Bachelor degree in Environmental Engineering L07**
University of Brescia, Environmental Engineering L07 (91/110)
Management and control of water and waste treatment, Advanced water and waste treatment, water treatment plant project
Thesis title: “I batteri filamentosi degli impianti di depurazione a fanghi attivi: correlazione con le condizioni di processo”

2003/2004 - 2007/2008 **High school diploma**
Scientific high school, Moretti, Gardone V.T.

Personal skills and competences

Mother tongue(s) **Italian**

Other language(s)

Self-assessment	Understanding		Speaking		Writing
European level (*)	Listening	Reading	Spoken interaction	Spoken production	
English	B1	B2	B1	B2	B2

(*) Common European Framework of Reference for Languages

Communication skills

- Good communication skills
- High flexibility

Organisational skills

- Aptitude to work for goals
- Excellent personal and group organizational skills, matured during her experiences as tutor of 4 graduate and 29 undergraduate students

Job-related skills

- Excellent knowledge of office package
- Good knowledge of XRD, TXRF, μXRF, UV-VIS spectrophotometer, ion chromatography instruments and their software of management and analysis of data (X'Pert Data Collector, X'Pert Highscore Plus Picofox);
- Good knowledge of SEM and TEM data processing;
- Good knowledge of software Ces Selector (Granta Design)
- Excellent skills of preparation of samples for microwave digestion and leaching tests and their analysis
- Team player

Driving licence

B

Additional information

Publications

1. Bontempi, E., Sorrentino, G.P., **Zanoletti, A**., Alessandri, I., Depero, L.E., Caneschi, A.. Sustainable Materials and their Contribution to the Sustainable Development Goals (SDGs): A Critical Review Based on an Italian Example, (2021). Molecules, Vol 26, Issue 5, 1407, https://doi.org/10.3390/molecules26051407;
2. Cornelio, A., **Zanoletti, A**., Federici, S., Depero, L.E., Bontempi, E. Porous materials derived from industrial by-products for titanium dioxide nanoparticles capture, (2020). Applied Sciences, Vol 10, Issue 22, Article number 8086, pp. 1-11 DOI: 10.3390/app10228086;
3. Fahimi, A, **Zanoletti, A**., Federici, S., Assi. A., Bilo, F., Depero, L.E., and Bontempi, E. New Eco-Materials Derived from Waste for Emerging Pollutants Adsorption: The Case of Diclofenac, (2020). Materials, Vol 13, 3964, DOI: 10.3390/ma13183964;
4. Assi, A., Bilo, F., **Zanoletti, A**., Borgese, L., Depero, L.E., Nenci., M., and Bontempi, E. Stabilization of Municipal Solid Waste Fly Ash, Obtained by Co-Combustion with Sewage Sludge, Mixed with Bottom Ash Derived by the Same Plant, (2020), Applied Sciences, Vol 10, 6075 DOI:10.3390/app10176075;
5. Assi, A., Bilo, F., **Zanoletti, A**., Ponti, J., Valsesia, A., La Spina, R., Depero, L.E., Bontempi, E. Review of the reuse possibilities concerning ash residues from thermal process in a medium-sized urban system in Northern Italy, (2020). Sustainability, Vol 12, Issue 10, Article number 4193;
6. Assi, A., Bilo, F., **Zanoletti, A**., Ducoli, S., Ramorino, G., Gobetti, A., Zacco, A., Federici, S., Depero, L.E., Bontempi, E. A Circular Economy Virtuous Example-Use of a Stabilized Waste Material Instead of Calcite to Produce Sustainable Composites, (2020). Applied Sciences (Switzerland) Vol 10, Issue 3, Article number 754, DOI: 10.3390/app10030754;
7. Assi, A. Bilo, F., **Zanoletti, A**., Ponti, J., Valsesia, A., La Spina, R., Zacco, A., Bontempi, E. Zero-waste approach in municipal solid waste incineration: Reuse of bottom ash to stabilize fly ash, (2020). Journal of Cleaner Production vol 245, Article number 118779. DOI: 10.1016/j.jclepro.2019.118779;
8. Bilo, F., Assi, A., **Zanoletti, A**., Bontempi, E. Dataset on the use of metal hydroxides, instead of flue gas desulfurization residues, to stabilize fly ash by using bottom ash, (2020). Data in Brief, vol 28, Article number 104970. DOI: 10.1016/j.dib.2019.104970;
9. **Zanoletti, A**., Bilo, F., Federici, S., Borgese, L., Depero, L.E., Ponti, J., Valsesia, A., La Spina, R., Segata, M., Montini, T., Bontempi, E. The first material made for air pollution control able to sequestrate fine and ultrafine air particulate matter, (2020). Sustainable Cities and Society, vol 53, Article number 101961, DOI: 10.1016/j.scs.2019.101961;
10. Benassi, L., **Zanoletti, A**., Depero, L.E., Bontempi, E. Sewage sludge ash recovery as valuable raw material for chemical stabilization of leachable heavy metals, (2019). Journal of Environmental Management, 245, pp. 464–470. Doi: https://doi.org/10.1016/j.jenvman.2019.05.104;
11. Bilo, F., **Zanoletti, A**., Borgese, L., Depero, L.E., Bontempi, E. Chemical analysis of air particulate matter trapped by a porous material, synthesized from silica fume and sodium alginate, (2019). Journal of Nanomaterials, Article ID. 1732196, https://doi.org/10.1155/2019/1732196;
12. **Zanoletti, A**., Bilo, F., Borgese, L., Depero, L.E., Fahimi, A., Ponti, J., Valsesia, A., Spina, R.L., Montini, T., Bontempi, E. SUNSPACE, A Porous Material to Reduce Air Particulate Matter (PM), (2018). Frontiers in Chemistry, vol 6, Article 534. doi: 10.3389/fchem.2018.00534;
13. **Zanoletti, A**., Bilo, F., Depero, L.E., Zappa, D., Bontempi, E. The first sustainable material designed for air particulate matter capture: An introduction to Azure Chemistry, (2018). Journal of Environmental Management, pp. 355-362. doi: 10.1016/j.jenvman.2018.04.081;
14. **Zanoletti, A**. Vassura, I., Venturini, E., Monai, M., Montini, T., Federici, S., Zacco, A., Treccani, L., Bontempi, E. A New Porous Hybrid Material Derived From Silica Fume and Alginate for Sustainable Pollutants Reduction, (2018). Frontiers in Chemistry, vol 6, Article 60. https://doi.org/10.3389/fchem.2018.00060;
15. Bontempi, E., **Zanoletti, A.**, Bilo, F., Tushev, K., Valente, G., Zappa, D., Treccani, L., Depero L.E. New Sustainable Hybrid Porous Materials for Air Particulate Matter Trapping, (2018). Materials Science Forum Vol 941, pp 2237-2242;
16. Pasquali, M., **Zanoletti, A**., Benassi, L., Federici, S., Depero, L.E., Bontempi, E. Stabilized biomass ash as a sustainable substitute for commercial P-fertilizers, (2018). Land Degradation and development, vol 29, pp 2199–2207. https://doi.org/10.1002/ldr.2915;
17. **Zanoletti A**., Bontempi E. Case study of raw materials substitution: Activated carbon substitution for wastewater treatments, (2017). SpringerBriefs in Applied Sciences and Technology (9783319608303), pp. 63-77;

18. **Zanoletti, A**., Federici, S., Borgese, L., Begerse, P., Ferroni, M., Depero, L.D. Bontempi, E. Embodied energy as key parameter for sustainable materials selection: The case of reusing coal fly ash from removing anionic surfactants, (2017). Journal of Cleaner Production, vol 141, pp 230-236. https://doi.org/10.1016/j.jclepro.2016.09.070;
19. Benassi, L., Pasquali, M., **Zanoletti, A.**, Dalipi, R., Borgese, L., Depero, L.E., Vassura, I. Quina, M.J., Bontempi, E. Chemical stabilization of Municipal solid waste incineration fly ash without any commercial chemicals: first pilot-plant scaling up, (2016). ACS Sustainable Chem. Eng, vol 4, pp 5561-5569. https://doi.org/10.1021/acssuschemeng.6b01294

Patents

- 'Process for obtaining a porous material from powder materials, a porous material and use thereof for the capture of atmospheric particulate matter and organic contaminants.' Authors of Document: BONTEMPI Elza; DEPERO Laura Eleonora; TRECCANI Laura and **ZANOLETTI Alessandra** (CONSORZIO INTERUNIVERSITARIO NAZIONALE PER LA SCIENZA E TECNOLOGIA DEI MATERIALI). Year the Document was Published 2018 Source of the Document: Patent Cooperation Treaty Application Patent number number WO2018134334

Projects

- She is participating in BIOMASS project, based on the syntehsis and characterization of nanostructured catalysts for the low temperature combustion of the residual gas from the upgrading process;
- She participated in the BASALTO project, based on the new porous material derived from silica fume and alginate to reduce air particulate matter. The project was funded by INSTM (Consorzio Interuniversitario nazionale per la Scienza e Tecnologia dei materiali) and Regione Lombardia;
- She participated in the RENDERING project, based on a novel method for heavy metals stabilization based on sewage sludge recovery. This project was funded by Ministero dell'Ambiente e della Tutela del Territorio e del Mare- Direzione generale per i rifiuti e l'inquinamento.

Conferences

- Climate Exp0 17-21 May 2021, online conference
  Oral presentation: "Recovery of industrial by-products for the synthesis of porous material able to reduce airborne particulate matter"
- Mining the European Anthroposphere (MINEA) Conference - Bologna 20-21 February 2020
  Poster presentation: "Urban mining from municipal solid waste incineration residues for zero- waste approach in waste-to-energy plants"
- Conference: "Convegno INSTM sulla Scienza e Tecnologia dei Materiali e al XV Convegno AIMAT" - Ischia, 21-24 luglio 2019, Italy
  Oral presentation: "SEWAGE SLUDGE ASH RECOVERY FOR HEAVY METALS STABILIZATION PROCESS"
  Poster presentation: "Process for the disposal of sewage sludge from civil and/or industrial wastewater and inert solid material obtained from combustion ash"
- UNEP Ministerial Conference "Innovative Solutions to Pollution in South East and Southern Europe", 4-5 December 2018, Belgrade
  Poster presentation: "A new porous hybrid material to reduce air particulate matter (PM)"
- TXRF 2017, 19-22 September 2017, Brescia, Italy
  Oral presentation: "Application of TXRF in characterization of air particulate matter trapped by a new material**"**
- AMAM 2017, International Conference on Applied Mineralogy & Advanced Materials, 5-9 June 2017, Castellaneta Marina, Italy
  Oral presentation: "POROUS COAL FLY ASH FOR ANIONIC SURFACTANTS REMOVAL**"**
- 2nd Green & Sustainable Chemistry Conference, 14-17 May 2017, Berlin, Germany
  Poster presentation: "REMOVAL OF ANIONIC SURFACTANTS BY A SUSTAINABLE POROUS MATERIAL**"**

Summer school

- 9-20 September 2019 (Siena): high school education: Siena Summer school on sustainable development
- 22-23 October 2018 (Gargnano): International Autumn school "From waste to microalgae"
- 23-26 January 2018 (Ravenna): Chemical school of environment and cultural heritage
- 23-26 January 2017 (Torino): Winter school: innovative approaches for material synthesis

Honours and awards

- Energy Globe Award 2020: the project regarding the porous material (SUNSPACE) for PM capture has been selected as national winner, 30 June 2020
- Best poster award, 2020, MINEA conference, 20-21 February 2020, Bologna
- Assignment of Full scholarship Leonardo for Siena Summer school on sustainable development, 9-20 September 2019
- The Basalto project was awarded INNOVATION Village 2019 prize (4 April 2019)
- The Basalto project was awarded GAETANO MARZOTTO prize (22 November 2018)
- The Basalto project was awarded OSCAR MASI prize, from the Italian Association of Industrial Research (AIRI) on 24 May 2018
- The Basalto project was awarded by a special recognition at the presence of Italian President (ITALIADECIDE). The project researchers were invited (12th February 2018) to the Camera dei Deputati in Rome for the prize

Last update to 31/05/2021