

## CV of Prof. Cristina Leonelli

### Address:

Full Professor,  
Dept. of Engineering "Enzo Ferrari" (<http://www.ingmo.unimore.it>),  
University of Modena & Reggio Emilia,  
Via Vignolese 905,  
41125 Modena,  
Italy  
e-mail: [cristina.leonelli@unimore.it](mailto:cristina.leonelli@unimore.it)  
Tel. +39 059 2056247  
Fax +39 059 2056243  
Microwave activity: <http://www.mag.unimo.it>  
Geopolymer activity: <http://www.icers.it/Default.aspx?IdCartella=65346>

### Education

University of Modena, Italy, Chemistry, MSc, 1986  
University of Modena & Reggio Emilia, Italy, Doctor of Chemistry, 1991

### Employment

2005-Present, Full Professor, Faculty of Engineering, University of Modena & Reggio Emilia.  
2000-2005 Associate Professor, Faculty of Engineering, University of Modena & Reggio Emilia.  
1999-2000 Associate Professor, Faculty of Engineering, University of Naples, Italy.  
1992-1999 Assistant Professor, Faculty of Engineering, University of Modena & Reggio Emilia.  
1986-1987 High School Teacher, Modena, Italy.

### Awards and Honors

- 1) Post – Grad Research Scholarship, University of Modena & Reggio Emilia (1987);
- 2) Appointed as Scientific Coordinator at the MAG - Microwave Application Group located at the Department of Materials and Environmental Engineering, Modena University;
- 3) Appointment as Member of the Board of Directors of AMPERE- Association for Microwave Power in Europe for Research and Education (2001);
- 4) Appointment as National Secretary for the Association AMPERE (2001);
- 5) Appointment as National Secretary of GIMAMP - National group for spreading microwave technology in industry and academy;
- 6) Nomination as General Secretary of the Association AMPERE (2008);
- 7) Founder and National Coordinator of the Working Group on Geopolymers within Italian Ceramic Society;
- 8) Appointed National Coordinator of the Working Group on Geopolymeric Materials-Italian Ceramic Society (2008, 2011);
- 9) Election to President of the Association AMPERE (2009, 2011, 2013, 2015);
- 10) Election to Member of the Advisory Board of the "Green Chemistry" Working Group within Italian Chemical Society (2009, 2011).
- 11) Nominated "Guest Professor" at Faculty of Metallurgical and Energy Engineering, Kunming University of Science and Technology, Kunming, Yunnan, People's Republic of China (2011).
- 12) Election to Member of the Advisory Board of the Italian association AICIng-Principles of Chemistry for applied Technologies (2014).

### Research interests

Research topics are in the field of material science and microwave assisted materials processing.

- 1) Microwave technology applied to:
  - chemical synthesis (inorganic powders of oxides, mixed oxides, carbonates, phosphates);
  - extraction (organic wastes, plants);
  - materials processing (from drying to melting, metals, polymers, wood, ceramics, oil products);

- 2) Chemical synthesis of nanoparticles of oxides, mixed oxides and doped oxides via hydrothermal and solvothermal syntheses.
- 3) Geopolymers (alkali activated inorganic materials) from basic science to insulating and structural materials applications.
- 4) Glass to glass-ceramic formulation, preparation and characterization for waste inertization.
- 5) Microstructure studies and non-destructive testing of ceramic material.
- 6) Archaeometric studies of ancient glasses from Roman Age mosaics –coloration and devitrification behaviour.

### **International projects and networks**

1999-2001

Local coordinator of the Working Group on "Application of Microwave Technology to Inorganic Materials, Processing and Synthesis" within Action COST- D10 " Innovative Methods and Techniques for Chemical Transformations" comprising 7 laboratories from 5 European countries.

2002-2004

Italian coordinator of the Joint Project funded by Royal Society for Italo-British collaboration. The English partner was Dept. of Materials, Imperial College, London, UK, and the topic was "Microwave processing of silicate matrix composite materials".

2003-2004

Italian coordinator of the Internationalization bilateral programme Italy-Russia funded from the Italian Ministry of Foreign Affairs. The Russian institution was the Experimental Design Bureau FAKEL, Moscow, Russia, and the topic was "New ceramic materials based on boron nitride for aerospace applications".

2003-2005

Italian coordinator of the Internationalization bilateral programme Italy-China funded from the Italian Ministry of Foreign Affairs. The Chinese institution was the Normal Yunnan University, Kunming City, People's Republic of China and the activity was "Microwave sintering of silver pastes for electronic applications".

2003-2009

Appointment from the Italian Ministry of University to:

- member Management Committee of Action COST D32-CHEM (Chemistry under High Energy Microenvironment), Human Capital & Mobility Programme, 6th Frame Programme of the European Union;
- coordinator of the Working Group WG 003/04 active in "Ultrasonic and microwave assisted synthesis of nanometric particles" comprising 11 laboratories from 7 European countries, plus Israel and Australia.

2007-2009

Italian coordinator of the Internationalization bilateral programme Italy-South Korea funded from the Italian Ministry of Foreign Affairs. The Korean institution was Materials Science and Engineering Department, Inha University, Korea, and the activity was "Mechanism of reaction between transparent dielectric and Ag electrode in plasma display panel using microwave heating".

2007-2010

Supervisor of ISTC Project # A-1523 "A new technology for obtaining complex glass charge for manufacture uviol glass" with the Armenian counterpart: «Stone and Silicates» Scientific-Industrial and Projecting Closed Joint-Stock Company, Yerevan, Armenia.

2009-2012

European Cooperative Research under the ERA-NET MATERA Project "Novel optical oxygen sensor for life and health protection made of nano-zirconia", partners are: Institute of High Pressure Physics (UNIPRESS) Polish Academy of Sciences, Warszawa, Poland/ Institute of Solid State Physics, University of Latvia, Riga, Latvia/ Bar-Ilan University, Israel, Ramat-Gan, Israel.

2007-2010

Supervisor of ISTC Project # A-1523 "A new technology for obtaining complex glass charge for manufacture uviol glass" with the Armenian counterpart: «Stone and Silicates» Scientific-Industrial and Projecting Closed Joint-Stock Company, Yerevan, Armenia.

#### **Collaborators & Other Affiliations**

Electrical Engineering and Information Technology Faculty, University of Oradea, Romania,  
Institute of Geotechnics, Slovak Academy of Science, Kosice, Slovakia,  
High Pressure Research Centre, Polish Academy of Sciences, Warsaw, Poland,  
Departamento de Comunicaciones, Universidad Politécnic de Valencia, Spagna,  
EMPA - Swiss Federal Laboratories for Materials Testing and Research, Thun, Switzerland,  
Department of Materials, Imperial College, Londra, UK,  
Institute of Solid State Physics, University of Latvia,  
Riga, Latvia/ Bar-Ilan University, Israel, Ramat-Gan, Israel,  
Glass Research Department, National Research Center, Dokki, Cairo, Egypt  
"Stone and Silicates" SI&PCJSC Institute, Yerevan, Armenia, The State Engineering University of Armenia,  
Materials Science and Engineering Department, Inha University, Korea,  
Department of Materials, Kasetsart University, Bangkok, Thailand,  
Department of Chemistry, Yunnan State University, Kunming, Yunnan, People's Republic of China,  
Faculty of Metallurgical and Energy Engineering, Kunming University of Science and Technology, Kunming, Yunnan, People's Republic of China,  
Department de Inorganique Chimie, Université de Yaoundè, Camerun, MIPROMALO, Yaoundè, Camerun,  
Dept. of Materials Science and Engineering, The University of New South Wales, Sydney, Australia.

#### **Editorial activity and publication list**

Cristina Leonelli is member of the editorial board of several international journals :

Journal of Microwave Power and Electromagnetic Energy (2011-2016),

Metals and Materials International (2005-now),

Korean Journal of Materials Research (2004-now),

AZojomo - Journal of Materials Online (2008-now),

Conference Papers in Science (2013-now),

Inorganics-Open Access (2013-now).

She works as reviewer for many journals in the field of materials science and chemical processing and has co-authored some books in Italian and English.

She has been co-editor of the first Italian book on Geopolymer (2011); she was Guest co-editor of Special Issue of Applied Clay Science (Volume 73, March 2013 Geopolymers: a new and smart way for a sustainable development) and has contributed to two chapters in the Handbook of Alkali-Activated Cements, Mortars and Concretes (2014).

She has been publishing the results of her research work in over than 266 scientific publications (Article (200), Conference Paper (49) Review (7) Book Chapter (6) Book (1) Editorial (3)) and 8 patents (Scopus: h index=29, updated July 2016).

#### **PATENT ON GEOPOLYMER TECHNOLOGY**

C. Leonelli, L. Barbieri, I. Lancellotti, E. Kamseu, C. Ponzoni, "Procedure for liquid waste inertization", Italian Patent: RE2012A000028, Deposit Date: 12/04/2012.

#### **PAPERS PUBLISHED IN INTERNATIONAL JOURNALS ON GEOPOLYMER TECHNOLOGY**

1. Tchakouté, H.K., Rüscher, C.H., Kong, S., Kamseu, E., Leonelli, C. , Geopolymer binders from metakaolin using sodium waterglass from waste glass and rice husk ash as alternative activators: A comparative study, *Construction and Building Materials* 2016, 114, 276-289.
2. Tchakouté, H.K., Rüscher, C.H., Kong, S., Kamseu, E., Leonelli, C. , Comparison of metakaolin-based geopolymer cements from commercial sodium waterglass and sodium waterglass from rice husk ash, *Journal of Sol-Gel Science and Technology*, 2016, 78 (3), 492-506.
3. Kamseu, E., Lancellotti, I., Sglavo, V.M., Modolo, L., Leonelli, C., Design of inorganic polymer mortar from ferricalsialic and calcsialic slags for indoor humidity control, *Materials*, 2016, 9 (6), 410.
4. Kamseu, E., Ponzoni, C., Tippayasam, C., Taurino, R., Chaysuwan, D., Sglavo, V.M., Thavorniti, P., Leonelli, C. a Self-compacting geopolymer concretes: Effects of addition of aluminosilicate-rich fines, *Journal of Building Engineering*, 2016, 5, 211-221.
5. Tippayasam, C., Balyore, P., Thavorniti, P., Kamseu, E., Leonelli, C., Chindaprasirt, P., Chaysuwan, D., Potassium alkali concentration and heat treatment affected metakaolin-based geopolymer, *Construction and Building Materials*, 2016, 104, 293-297.
6. Kamseu, E. , Djangang, C., Veronesi, P., Fernanda, A., Melo, U.C., Sglavo, V.M., Leonelli, C., Transformation of the geopolymer gels to crystalline bonds in cold-setting refractory concretes: Pore evolution, mechanical strength and microstructure, *Materials and Design*, 2015, 88, 336-344.
7. Kamseu, E., Ponzoni, C., Tippayasam, C., Taurino, R., Chaysuwan, D., Bignozzi, M.C.c, Barbieri, L., Leonelli, C., Influence of fine aggregates on the microstructure, porosity and chemico-mechanical stability of inorganic polymer concretes, *Construction and Building Materials*, 2015, 96, 473-483.
8. Fongang, R.T.T., Pemndje, J., Lemougna, P.N., Melo, U.C., Nanseu, C.P., Nait-Ali, B., Kamseu, E., Leonelli, C., Cleaner production of the lightweight insulating composites: Microstructure, pore network and thermal conductivity, *Energy and Buildings*, 2015, 107, 113-122.
9. Ngouloure, Z.N.M., Nait-Ali, B., Zekeng, S., Kamseu, E., Melo, U.C., Smith, D., Leonelli, C., Recycled natural wastes in metakaolin based porous geopolymers for insulating applications, *Journal of Building Engineering*, 2015, 3, 58-69.
10. Ponzoni, C., Lancellotti, I., Barbieri, L., Spinella, A., Saladino, M.L., Martino, D.C., Caponetti, E., Armetta, F., Leonelli, C., Chromium liquid waste inertization in an inorganic alkali activated matrix: Leaching and NMR multinuclear approach, *Journal of Hazardous Materials*, 2015, 286, 474-483.
11. Kamseu, E., Ngouloure, Z.N.M., Ali, B.N., Zekeng, S., Melo, U.C., Rossignol, S., Leonelli, C., Cumulative pore volume, pore size distribution and phases percolation in porous inorganic polymer composites: Relation microstructure and effective thermal conductivity, *Energy and Buildings*, 2015, 88, 45-56.
12. Lancellotti, I., Ponzoni, C., Barbieri, L., Leonelli, C., Wastes materials in geopolymers, *Wastes: Solutions, Treatments and Opportunities - Selected Papers from the 3<sup>rd</sup> Edition of the International Conference on Wastes: Solutions, Treatments and Opportunities*, 2015, pp. 115-119.
13. Lancellotti, I., Cannio, M., Bollino, F., Catauro, M., Barbieri, L., Leonelli, C., Geopolymers: An option for the valorization of incinerator bottom ash derived "end of waste", *Ceramics International*, 2015, 41 (2), 2116-2123.
14. Djangang, C.N., Tealdi, C., Cattaneo, A.S., Mustarelli, P., Kamseu, E., Leonelli, C., Cold-setting refractory composites from cordierite and mullite-cordierite design with geopolymer paste as binder: Thermal behavior and phase evolution, *Materials Chemistry and Physics*, 2015, 154, 66-77.
15. Leonelli, C., Romagnoli, M., Rheology parameters of alkali-activated geopolymeric concrete binders, *Handbook of Alkali-Activated Cements, Mortars and Concretes*, 2014, pp. 133-169. Elsevier, ISBN: 978-178242288-4.
16. Lancellotti, I., Barbieri, L., Leonelli, C., Use of alkali-activated concrete binders for toxic waste immobilization, 2014, pp. 539-554, Elsevier, ISBN: 978-178242288-4.
17. Tippayasam, C., Keawpapasson, P., Thavorniti, P., Panyathanmaporn, T., Leonelli, C., Chaysuwan, D., Effect of Thai Kaolin on properties of agricultural ash blended geopolymers, *Construction and Building Materials*, 2014, 53, 455-459.
18. Lancellotti, I., Ponzoni, C., Bignozzi, M.C., Barbieri, L., Leonelli, C., Incinerator bottom ash and ladle slag for geopolymers preparation, *Waste and Biomass Valorization*, 2014, 5 (3), 393-401.
19. Chaysuwan, D., Tippayasam, C., Keawpapasson, P., Thavorniti, P., Panyathanmaporn, T., Jiemsirilers, S., Leonelli, C., Development of Thai fly ash blended with rice husk ash geopolymers, *Ceramic Transactions*, 2014, 244, 145-153.

20. Kamseu, E., Cannio, M., Obonyo, E.A., Tobias, F., Bignozzi, M.C., Sglavo, V.M., Leonelli, C., Metakaolin-based inorganic polymer composite: Effects of fine aggregate composition and structure on porosity evolution, microstructure and mechanical properties, *Cement and Concrete Composites*, 2014, 53, 258-269.
21. Obonyo, E.A., Kamseu, E.b, Lemougna, P.N., Tchamba, A.B., Melo, U.C., Leonelli, C., A sustainable approach for the geopolymerization of natural iron-rich aluminosilicate materials, *Sustainability (Switzerland)*, 2014, 6 (9), 5535-5553.
22. Keawpapasson, P., Tippayasam, C., Ruangjan, S., Thavorniti, P., Panyathanmaporn, T., Fontaine, A., Leonelli, C., Chaysuwan, D., Metakaolin-based porous geopolymer with aluminium powder, *Key Engineering Materials*, 2014, 608, 132-138.
23. Lancellotti, I., Ponzoni, C., Barbieri, L., Leonelli, C., Alkali activation processes for incinerator residues management, *Waste Management*, 2013, 33 (8), 1740-1749.
24. Lancellotti, I., Catauro, M., Ponzoni, C., Bollino, F., Leonelli, C., Inorganic polymers from alkali activation of metakaolin: Effect of setting and curing on structure, *Journal of Solid State Chemistry*, 2013, 200, 341-348.
25. Benito, P., Leonelli, C., Medri, V., Vaccari, A., Geopolymers: A new and smart way for a sustainable development, *Applied Clay Science*, 2013, 73 (1), pp. 1.
26. Bignozzi, M.C., Manzi, S., Lancellotti, I., Kamseu, E., Barbieri, L., Leonelli, C., Mix-design and characterization of alkali activated materials based on metakaolin and ladle slag, *Applied Clay Science*, 2013, 73 (1), 78-85.
27. Kamseu, E., Bignozzi, M.C., Melo, U.C., Leonelli, C., Sglavo, V.M., Design of inorganic polymer cements: Effects of matrix strengthening on microstructure, *Construction and Building Materials*, 2013, 38, 1135-1145.
28. Kamseu, E., Nzeukou, A., Lemougna, P., Billong, N., Melo, U.C., Leonelli, C., Induration of laterites in tropical areas: Assessment for potential structural applications, *InterCeram: International Ceramic Review*, 2013, 62 (6), 430-437.
29. Romagnoli, M., Leonelli, C., Kamseu, E., Lassinantti Gualtieri, M., Rheology of geopolymer by DOE approach, *Construction and Building Materials*, 2012, 36, 251-258.
30. Kamseu E, Nait-Ali B, Bignozzi MC, Leonelli C, Rossignol S, Smith DS. Bulk composition and microstructure dependence of effective thermal conductivity of porous inorganic polymer cements. *Journal of the European Ceramic Society* 2012;32(8):1593-603.
31. Kamseu E, Catania V, Djangang C, Sglavo VM, Leonelli C. Correlation between microstructural evolution and mechanical properties of a-quartz and alumina reinforced K-geopolymers during high temperature treatments. *Advances in Applied Ceramics* 2012;111(3):120-8.
32. Kamseu E, Leonelli C, Chinje Melo UF, Perera D, Lemougna PN. Polysialate matrixes from al-rich and si-rich metakaolins: Polycondensation and physico-chemical properties. *InterCeram: International Ceramic Review* 2011;60(1):25-31.
33. Kamseu E, Ceron B, Tobias H, Leonelli E, Bignozzi MC, Muscio A, Libbra A. Insulating behavior of metakaolin-based geopolymer materials assess with heat flux meter and laser flash techniques. *Journal of Thermal Analysis and Calorimetry* 2011:1-11.
34. Kamseu E, Leonelli C, Perera DS. Geopolymers sintering by optical dilatometry. *Ceramic Transactions* 2010;209:91-9.
35. Kamseu E, Rizzuti A, Leonelli C, Perera D. Enhanced thermal stability in K<sub>2</sub>O-metakaolin-based geopolymer concretes by Al<sub>2</sub>O<sub>3</sub> and SiO<sub>2</sub> fillers addition. *J Mater Sci* 2010;45(7):1715-24.
36. Lancellotti I, Kamseu E, Michelazzi M, Barbieri L, Corradi A, Leonelli C. Chemical stability of geopolymers containing municipal solid waste incinerator fly ash. *Waste Manage* 2010;30(4):673-9.
37. Kamseu E, Leonelli C, Sglavo VM, Boccaccini DN, Veronesi P, Melo UC, Njopwouo D. Alkali-silica glassy matrixes (AGM) as replacement for feldspar in conventional porcelain compositions. *Silicates Industriels* 2009;74(5-6):131-9.
38. Kamseu E, Leonelli C, Perera DS, Melo UC, Lemougna PN. Investigation of volcanic ash based geopolymers as potential building materials. *InterCeram: International Ceramic Review* 2009;58(2-3):136-40.