

CURRICULUM VITAE

Prof. Claudio Francesco Badini

Born in Turin on July 22th, 1954; master's degree in Chemistry at the Turin University on July 12th, 1978, with a thesis titled "Characterisation of metal-glasses Fe-Ni based".

- Manager of "Chemistry and Pharmaceutical Technique" laboratory at the "Istituto Biologico Chemioterapico" firm of Turin from 1979 to 1983.
- Staff researcher at Politecnico di Torino, Department of Material Science and Chemical Engineering from 1983 to 1992.
- Associate professor of Chemistry from 1992.
- Associate professor of Materials Science and Technology from 1999.
- Full professor of Materials Science and Technology at the Department of Materials Science and Chemical Engineering of Politecnico di Torino from 2001.
- At present full professor of Material Science and Technology at the Department of Applied Science and Technology of Politecnico di Torino.
- Chairman of bachelor and master degrees on Materials Engineering from 2003 to 2015.
- Coordinator of Ph.D course in Materials Science and Technology from January 2011 to September 2018.

The research activities have been mainly aimed at: processing and characterizing innovative materials for applications at high temperatures (metal-based and ceramic-based composites, ultra-high temperature ceramics, intermetallics, nano-composites), developing catalysts, investigating the kinetic of solid state precipitation and combustion processes. Author or co-author of more than 280 scientific reports published in international and Italian journals or presented at scientific congresses. Author of three patents. Active member of "Consorzio Interuniversitario Nazionale per la Scienza e la Tecnologia dei Materiali" and "Associazione Italiana di Ingegneria dei Materiali". The scientific work has been performed in the framework of several research projects funded by the European Community, Italian Public Institutions and Private Companies, that are listed hereafter.

Scientific coordinator at the Politecnico di Torino for the following **U.E. research projects of VII** framework programme:

1. Large scale integrating project "New materials for extreme environment" (ExtreMat) – 2005/2009
2. Large scale integrating project "Validation of Radical Engine Architecture Systems" (DREAM) – 2008/2010; team leader at the Department of Materials Science and Chemical Engineering
3. Collaborative Project – "Multifunctional components for aggressive environment in space applications" (SMARTEES) - 2011/2013
4. Collaborative project – "Physical processing of molten light alloys under the influence of external fields" (EXOMET) – 2012-2016

Member of the **research team** of Politecnico di Torino taking part in the following research projects funded by E.U.:

1. Project Brite-Euram "Development of a lifetime prediction method to improve the design of premixed radiant burners for domestic applications" (LIFEBURN) – 1998-2001
2. Project Brite-Euram "Catalytic traps for diesel particulate control" (CATATRAPP) - 1999-2001
3. 5th Framework Programme "Advanced regeneration technologies for diesel exhaust particulate aftertreatment" (ART-DEXA) – 2000-2003
4. 5th Framework Programme "System level optimization and control tools for diesel exhaust aftertreatment" (SYLOC-DEXA) – 2000-2003

5. 7th Framework Programme - CERamic Heat EXchangers with enhanced materials Properties (CEREXPRO) – Collaborative Project - 2009-2012
6. 7th Framework Programme – Collaborative Project – “Additive manufacturing aiming towards waste & efficient production of high-tech metal products” (AMAZE) – 2013-2018

Scientific coordinator at the Politecnico di Torino for the following research projects funded (during the last years) by Italian public bodies:

1. Innovative solutions for control system, electric plant, materials and technologies for a non conventional remotely-piloted aircraft (ETF06) – Piedmont regional project - 2007-2009
2. GREAT 2020 – GReen Engine for Air Traffic 2020 – Piedmont regional project – 2009-2012
3. GREAT 2020 fase II – GReen Engine for Air Traffic 2020 – Piedmont regional project – 2013-2016
4. Ricerca di Sistema Elettrico Nazionale – Italian Ministry of Economic Development – 2014-2016
5. Green Factory for Composites - Piedmont regional project - 2016-2019.
6. Additive Manufacturing e automazione processo per materiali ibridi e Compositi (AMICO) – Program PON R&I 2014-2020 – 2018-2021.
7. Scarti organici e Anidride carbonica Trasformati in carbURanti, fertilizzanti e prodotti chimici; applicazione concreta dell’ecoNOmia circolare (SATURNO) – POR FESR Piedmont regional project – 2019-2022.

Scientific coordinator at the Politecnico di Torino- Dpt. DISAT for the following research projects funded by Italian Companies (during the last 10 years):

1. Avio: “Studi e ricerche su componenti critici delle turbomacchine II (superleghe e rivestimenti)” – 2005-2007
2. Avio: “Studio dei trattamenti termici per la superlega base nichel UDIMET720 LI” – 2005-2007
3. Avio: “Studi e ricerche su materiali per palette e dischi di turbina” - 2006-2008
4. Avio: “Sviluppo di un materiale ceramico multistrato base SiC per la realizzazione di inserti per palette di turbina” – 2007-2010
5. Alenia Aeronautica: “Friction Stir Welding” – 2007-2009
6. Avio: “Ottimizzazione dei trattamenti termici di leghe intermetalliche Ti-Al di seconda e terza generazione” – 2008-2010
7. Avio: “Nuovi materiali intermetallici per applicazioni aeronautiche” – 2008-2010
8. FCA “CO₂ Reduction by Lightweight Design of Body” -2013-2014
9. FCA: “Circular economy for recovery and recycling of car materials” – 2017
10. FCA: “Additive manufacturing of polymer-based composites with enhanced mechanical behaviour and electrical functionalities”- 2019

Publications of

Prof. Badini Claudio
(h index 33 – Scopus)

International Journals

1. C. Badini, C. Gianoglio, G. Pradelli, "Distribution of chromium and nickel between the phases

- present in the borided layer of alloy steels", *Met. Sci. Technol.*, **3**, (1985), 10.
2. G. Grassi, L. Stafferi, C. Badini, "E-glass fibres with a surface coating: reaction to alkaline attack", *Silicates Industriels*, **50**, (1985), 143.
 3. C. Gianoglio, C. Badini, "Effect of chromium and boron on the morphological and hardness characteristics of cementite", *Metall. Ital.*, **77**, Aprile, (1985), 289.
 4. G. Pradelli, M. Rosso, C. Badini, G. Scavino, E. Ramous, A. Tiziani, "Compacted graphite cast irons- Characteristics of pig and cast iron castings inoculated by calcium containing alloys", *Metall. Ital.*, **78**, Maggio, (1986), 393.
 5. C. Badini, C. Gianoglio, G. Pradelli, "Preferential distribution of chromium and nickel in the borided layer obtained on synthetic Fe-Cr-Ni alloys", *J. Mater. Sci.*, **21**, (1986), 1721.
 6. M. Rosso, C. Badini, G. Scavino, Giorgio "Boriding of sintered ferrous products with Cr, Ni and Mo" 1, (1986) pp. 381-384.
 7. C. Gianoglio, C. Badini, "Distribution equilibria of iron and nickel in two phase fields of the Fe-Ni-B system", *J. Mater. Sci.*, **21**, (1986), 4331.
 8. G. Pradelli, C. Gianoglio, C. Badini, "Balance of distribution of some transition metals between the (M',M'')B and (M',M'')₂B phases", *Met. Trans. A*, **17**, (1986), 1665.
 9. C. Badini, C. Gianoglio, G. Pradelli, "The effect of carbon, chromium and nickel on the hardness of borided layers", *Surf. Coat. Tech.*, **30**, (1987), 157.
 10. M. Rosso, C. Badini, G. Scavino, "Boronizing of sintered ferrous materials", *Metall. Ital.*, **79**, (1987), 133.
 11. C. Badini, C. Gianoglio, G. Pradelli, "Boriding of steels: some notes on boron diffusion mechanism", *Metall. Ital.*, **79**, (1987), 747.
 12. C. Badini, D. Mazza, "Preferred orientation of the boride crystals in the borided layers: a quantitative method of evaluation", *J. Mater. Sci.*, **23**, (1988), 3061.
 13. C. Badini, C. Gianoglio, G. Pradelli, "Surface Hardening of Titanium Alloys: Chemical Characterisation of the Nitrided Layers", *Metall. Ital.*, **80**, (1988), 525.
 14. C. Badini, C. Gianoglio, G. Pradelli "Chemical, morphological and microhardness characteristics of boronized iron alloys" *Metallurgia Italiana*, **80** (6), (1988) pp. 533-534.
 15. C. Badini, D. Mazza, "The texture of borided layers grown on Fe-Ni and Fe-Cr alloy", *J. Mater. Sci. Lett.*, **7**, (1988), 661.
 16. C. Badini, C. Gianoglio, T. Bacci, B. Tesi, "Characterization of surface layers in ion-nitrided titanium and titanium alloys", *J. Less Comm. Metals*, **143**, (1988), 129.
 17. C. Badini, D. Mazza, T. Bacci, "Texture of surface layers obtained by ion nitriding of titanium alloys", *Mat. Chem. Phys.*, **20**, (1988), 559.
 18. E. Quadrini, C. Badini, "Effect of boriding surface treatment on hydrogen embrittlement of UNI 30NiCrMo12 steel", *Mat. Chem. Phys.*, **24**, (1989) 111.
 19. C. Badini, "SiC whiskers-aluminium 6061 composite: microstructure and mechanical characteristic anisotropy", *J. Mater. Sci.*, **25**, (1990) 2607.
 20. C. Badini, F. Marino, A. Tomasi, "DSC study of ageing sequence in 6061 aluminium alloy-SiC whiskers composite", *Mat. Chem. Phys.*, **25**, (1990) 57.
 21. T. Bacci, G. Pradelli, B. Tesi, C. Gianoglio, C. Badini, "Surface engineering and chemical characterization in ion-nitrided titanium and titanium alloys", *J. Mater. Sci.*, **25** (1990) 4309.
 22. C. Gianoglio, G. Pradelli, D. Elezi, C. Badini, "On borocarbides present in borided layers of steels", *Mater. Eng.*, **3**, (1990), 1023.
 23. T. Bacci, G. Pradelli, B. Tesi, C. Badini, C. Gianoglio, "β transus influence on α-β titanium alloys behaviour in ion- nitriding process", *Mat. Chem. Phys.*, **25**, (1990), 237.
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26. C. Badini, F. Marino, A. Tomasi, "Kinetics of precipitation hardening in SiC whiskers reinforced 6061 aluminium alloy", *J. Mater.Sci.*, **26**, (1991), 6279.
27. G. Principi, A. Gupta, C. Badini, "Structural study of borided layers obtained on synthetic Fe-Ni alloys", *Hyperfine Interactions*, **69**, (1991), 479.
28. C. Badini, M. Bianco, S. Talentino, X.B. Guo and C. Gianoglio, "Laser boronizing of some titanium alloys", *Appl. Surf. Sci.*, **54**, (1992), 374.
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33. M. Ferraris, C. Badini, B. Couzinet, "Interfacial equilibria in Ti-particles/glass ceramic composites", *Composites*, **25**, (1994), 494.
34. M. Ferraris, C. Badini "Glass and glass-ceramic matrix composites [Article@Materiali compositi a matrice vetrosa e vetroceramica]" *Ceramurgia*, **24** (2), (1994) pp. 51-57.
35. M. Montorsi, C. Badini, E. Verne "Control of emissions from diesel engine vehicles" *Ceramurgia*, **24** (2), (1994) pp. 41-50.
36. M. Ferraris, C. Badini, M. Montorsi, P. Appendino, H.W. Scholz, «Joining of SiC_f/SiC composites for thermonuclear fusion reactors», *J. Nucl. Mater.*, **212**, (1994), 1613.
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38. C. Badini, M. Ferraris, F. Marchetti, "Interfacial reaction in AZ61/AZ91/P100 Mg/graphite composite: an Auger spectroscopy investigation", *Mater. Lett.*, **21**, (1994), 55.
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45. V. Serra, G. Saracco, C. Badini and V. Specchia, "Combustion of carbonaceous materials on Cu-K-V based catalysts. Part II. Reaction mechanism", *Appl. Cat. B*, **11**, (1997), 329.
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- combustion catalysts for application in diesel exhaust treatment", *Appl. Cat. B*, **18** (1998), 137.
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 53. G. Saracco, C. Badini and V. Specchia, "Catalytic traps for diesel particulate control", *Chem. Eng. Sci.*, **54**, (1999), 3035.
 54. G. Saracco, C. Badini, N. Russo and V. Specchia, "Development of catalysts based on pyrovanadates for diesel soot combustion", *Appl. Cat. B*, **21**, (1999), 233.
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 56. C. Badini, M. La Vecchia, P. Fino, P. Cobelli, "Gravity casting processing of brake discs: use of partially recycled Al-Si-Mg/SiC_p composite", *Mater. Sci. Technol.*, **16**, (2000), 681.
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 61. C. Badini, F. Laurella, "Oxidation of FeCrAl alloy: influence of temperature and atmosphere on scale growth rate and mechanism", *Surf. Coat. Tech.*, **135**, (2001) 291.
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- thick films for superconducting application”, *J. Eur. Ceram. Soc.*, **24**, (2004) 1837-1840.
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