CV Massimiliano Cavallini

Birthplace and birthday: San Marcello (Pistoia), Tuscany Italy 19/02/1967.
Citizenship: Italian.

Home Address: Via Lucca 62, I-40038 Vergato (Bo). Tel.:+39 051 6398519,
E-mail: m.cavallini@bo.ismn.cnr.it.

Known languages: Italian, English, French (elementary level).

Present Position
Research Scientist PRIMO RICERCATORE II LIVELLO with term contract at CNR- Instituto per lo Studio dei Materiali Nanostrutturati. Bologna. Research Section on Nanotechnology of Multifunctional Materials.

Education
Ph.D. in Chemistry at University of Florence (February 1999).
Thesis title: "Electrochemical synthesis and in-situ STM characterization of semiconductors II-VI"
Laurea in chemistry *Cum Laude* at University of Florence (April 1994). Final mark: ***110/110 Cum Laude***.
Others courses: "Project Management", "Business Planning" and "Communication" in the Spinner Training Program.

Honours

1994: Winner of national prize for graduate students **"Chemistry of Materials"** organized by: Consorzio Interuniversitario Nazionale per la Chimica dei Materiali.
2000: Winner of national prize for Ph.D. Thesis **"Mario Lazzari"** organized by the Electrochemical division of **the Italian Chemical Society**.
2003: Member of consortium "Mols-in-motion" **finalist at "Decartes Prize"** organized by the commission of European Community.
2004: Winner of regional prize "Start-Cup" for project of new "Spin-Off" organized by ALMA Mat Foundation, Consortium SPINNER and University of Bologna.
2005 "2005 Shop notes award" for the paper "Electrochemical Fabrication of Cobalt and Nickel Tips for Scanning Tunneling Microscopy" by AVS Vacuum technology division.
2006 Winner of **EURYI (European Young Investigator Awards)** 2006 organized by **European Science Foundation**.

Professional Experience

1995-1998 Student of Doctorate of Philosophy, Department of Chemistry, Florence University. During the Ph.D. I spent three months at University Ulm in Germany (Electrochemistry laboratories of Prof. D.M. Kolb)
1999-30 April 2001 Post-Doctoral position at CNR-ISMN-Bologna (formerly Institute of Molecular Spectroscopy).
From 1 May 2001 to date: research scientist with term contract at ISMN-Bo.
2002 Set up the laboratory of "unconventional nanolithography" at ISMN-Bo.
2004 Set up the laboratory of "Rapid Prototyping" at ISMN-Bo. The new laboratory is also suitable to work on nanopatterning with biological materials.
2007 Group leader at ISMN-Bo for the develop of the **EURYI** project.

Research Interests

- Nanotechnology, unconventional nanolithography, development of new processes.
- Scanning probe microscopies, included, SPM under electrochemical control and spin polarised STM.
- Organic, inorganic and hybrid thin films (including magnetic materials).
- Supramolecular systems: thin film growth and applications in nanotechnology.
- Development of new tools for nanotechnologies and new Scanning Probe microscopes.
- Wetting/dewetting processes.
- Self-assembly and self-organization processes.
- Organic based memories.

I am involved in several European and Italian projects: SCRIBA, COME-NO, SELOA, ENBAC, DRUM, MONA-LISA, EMMMA, LAMINATE, FUNSMART, COST19, CHEXTAN, NAIMO and CANAPE, .

I am collaborating with many scientists with backgrounds in Chemistry, Physics, Biology and Engineering.

I am author of **61 papers in international journals** (with high impact factor (see list of publications) whose **3 chapter of book**. The most important publication are: one communication on **Science** (2003), one on **Nature Materials** (2003), one on *Proc. Natl. Acad. Sci. U.S.A.* ***(2006)*** two communications on **Angewandte Chemie International Edition** (2005,2006) one featuring also the frontispiece of communication section, one on **Physical Review Letters** (2004), 5 communications on **Nano Letters** (2001-2005), one on **Applied Physics Letters** (2003)**,** 5 articles on **Journal of American Chemical Society** (2002-2005).

A paper published on *Journal of Vacuum Science and Technology* B received the **2005 shop notes award by AVS Vacuum technology division.**

Up to February 2007 I received 784 citations. In particular the papers of which I am the first author (*Science 2003*) has received **t**he rate of citation so far by this paper places it in **the top 1% of papers** published in chemistry and physics in 2003 (according to ISI Essential Science Indicators).

The paper published on PNAS 2006 received the highlight by the review Nature Nanotechnology. Furthermore 4 of my papers were selected by the Virtual Journal of Nanoscale Science & Technology.

I am referee of some international review, such as Applied Physics Letters, The Journal Applied Physics, Nano Letters, Advanced Functional Materials, The Journal of Physical chemistry and Surface Science.

I have **experience in intellectual property** rights and patent writing. I hold 7 national and international patents, all of them related to nanofabrication and information storage processes.

I have experience in team leadership, project management (see below).

I have more than 60 communications in international conferences and workshops. I was invited to do many seminars in international institutions, including **Cavendish Laboratory - Univ. of Cambridge (UK)** (2002)**,** Physics Department, University of L'Aquila (2003)**;** Chemistry Department, University of Florence (2003). I have been lecturers at **Academia dei Fisiocritici of Siena** for the **"International LAMINATE School" (2003)**, an invited lecture at "SPM and Organic Materials XIV workshop" at the **Deutsches museum in** Munich (D)(2005).

I supervised of several Ph.D. students and post-docs in **Chemistry and Physics**. Although I started with a physical-chemistry background, I have developed a **real multidisciplinary** approach to scientific problems and do not fear new experiences, learning new techniques, and take new research avenues where I am required to enrich my background.

In the 2005 I **founded a spin-off company** named SCRIBA Nanotecnologie S.r.L. working in the field of Nanotechnology**.**

Experience in team leadership, project management and conference organization:

- *2005* founded **a Spin-off** company named **SCRIBA Nanotecnologie** working in the field of Nanotechnology of which is currently director of R&D.
- *2005* coordinator of the project Bottom-Up Writing (BUW) after Care supported by the Consortium SPINNER (Region Emilia Romagna, European.
- *2005* **member of the organizing committee** of the 8th European Conference on Molecular Electronics (ECME8).
- *2004* principal investigator and member of the steering committee of the EU-Marie Curie Research Training Network *CHEXTAN* (*Chiral Expression and Transfer at the Nanoscale).*
- *2003-2004* Task leader and scientist in charge for ISMN-NMM in the projects FIRB NOMADE, Legge 95/95 SCRIBA, ESF-FUNSMARTS, IP-NAIMO, IP-CANAPE*.*
- *2001-2005* scientific supervisor of 4 Ph.D. students in Chemistry, and two post-docs in Physics (one from India and one from Argentina).
- *2003* coordinator of the project BUW supported by the Consortium SPINNER (Region Emilia Romagna, European Social Fund, Univ. of Bologna) for Spin-off enterprise creation.
- *2002 and 2004* designed, obtained funding, and made operating two new laboratories at ISMN-Bo of which is currently responsible.
- *2002-2007* key-aid of Dr. Fabio Biscarini in the coordination, management and reporting on several EU and National projects.
- *Since 2007 group leader of group "Nanofabrication of functional complex systems" at ISMN-CNR*

Scientific Collaborations

Italy

D.Gatteschi, M.L. Foresti, M. Innocenti Dipartimento di Chimica, Università di Firenze.
Dr. G. Barbarella, M. Melucci CNR-ISOF, Bologna.
Prof. F. Zerbetto, Prof. A. Credi, Dip. Chimica "G. Ciamician", Universitá di Bologna.

International

Dr. R. Lazzaroni, P. Leclere, Service de Chimie Materiaux Nouveaux, Université de Mons - Hainaut, Belgium.
Dr. R. García, CSIC -Instituto de Microelectrónica de Madrid , Tres Cantos, Spain.
Prof. K. Müllen, Max-Planck Institute for PolymerForschung, Mainz, Germany
Prof. D. A. Leigh, Department of Chemistry, University of Warwick, Coventry UK.
Prof. J. Veciana, C. Rovina, D. Amabilino and Daniel Ruiz-Molina Instituto de Ciencia de Materiales – CSIC, Barcelona.
Dr. P. Levy, CNEA Buenos Aires, Argentina.
Prof. Mario Ruben Institute of Nanotechnology (INT) Forschungszentrum Karlsruhe
Prof. Martin Nielsen The Danish Polymer Centre, Risø National Laboratory, (Denmark).
Prof. Yve Gertz (Univ. Libre Belgique Bruxelles)

Industrial Collaborations

- Philips Research Laboratories (Dr. D. De Leeuw), Eindhoven, The Netherlands.
- STMicroelectronics (Dr. Salvo Coffa), Catania, Italy
- SCRIBA Nanotecnologie S.r.l., Bologna, Italy
- Johnson Matthey Technology Centre UK (Dr.Antonella di Trapani)

Referees

Dr. Fabio Biscarini CNR-ISMN-Bo. Research Scientist, Head of Nanotechnology of Multifunctionals Materials research line. Phone: +39-051-6398622. E-mail: f.biscarini@bo.ismn.cnr.it.

Prof. Maria Luisa Foresti. Professor of Electrochemistry at Florence University. Phone:+39-055-4573107 E-mail. foresti@unifi.it

Prof. Roberto Lazzaroni University of Mons-Hainaut, Belgium. Phone +32 (0)65-3738-60/62 E-mail: Roberto@averell.umh.ac.be.

Prof. Jaume Veciana, CSIC-Institut Ciencia de Materials de Barcelona (ICMAB), Phone: +34-93-5801853 (ext 246), E-Mail: vecianaj@icmab.es,

LIST OF PUBLICATIONS

Lavori su riviste internazionali con referaggio

Nota 1: Le citazioni sono state inserite in accordo con i motori di ricerca “Web of Science” o “SCOPUS” secondo quanto indicato nella specifica citazione,
Nota 2: I lavori indicati con un asterisco sono quelli utili per il calcolo dell’”H-Factor”

2007

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Room temperature deposition of magnetite thin films on organic substrate
E. Arisi, I. Bergenti, M. Cavallini, M. Murgia, A. Riminucci, G. Ruani and V. Dediu

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Magnetic properties of Cobalt thin films deposited on soft organic layers
I. Bergenti, A. Riminucci, E. Arisi, M. Murgia, M. Cavallini, M. Solzi, F. Casoli and V. Dediu

59) *Electrochimica Acta **52** (*2007) *6034-6040*
Patterned growth of CdS by combined Electrochemical Atomic Layer Epitaxy and Microcontact Printing Techniques
E. Salvietti, F. Loglio, M. Innocenti, M. Cavallini, M. Facchini, G. Pezzatini, R. Raiteri, M.L. Foresti

58) *Journal of Magnetism and Magnetic Materials **310** (2007*) e780-e782.
Ultrathin manganite films grown by pulsed-plasma deposition
I. Bergenti, A. Riminucci, E. Arisi, L.E. Hueso, M. Cavallini, M. Solzi, V. Dediu

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Spin polarized $La_{0.7}Sr_{0.3}MnO_3$ thin films on silicon
I. Bergenti,, V. Dediu, E. Arisi, M. Cavallini, F. Biscarini, C. Taliani, M.P. deJong, C.L. Dennis, J.F. Gregg, M. Solzi, M. Natali

*56) The Journal of Physical Chemistry C.***111(3***)* 1061-1064 (2007). Citazioni (Web of Science) 0
Ordered Patterning of Nanometric Rings of Single Molecule Magnets on Polymers by Lithographic Control of De Mixing
M. Cavallini*, M. Facchini, C. Albonetti, F. Biscarini, M. Innocenti, F. Loglio, E. Salvietti, G. Pezzatini M.L. Foresti

55) Journal of Materials Chemistry 2007, **17**, 728 - 735. Citazioni (Web of Science) 0
Solid-State Assemblies and Optical Properties of Conjugated Oligomers Combining Fluorene and Thiophene Units M. Surin, P. Sonar, A. C. Grimsdale, K. Müllen, S. De Feyter, S. Habuchi, S. Sarzi, M. Van der Auweraer, F. C. De Schryver, M. Cavallini, J.-F. Moulin, F. Biscarini, C. Femioni, R. Lazzaroni, P. Leclère.

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Field-effect transistors with organic semiconductor layers assembled from aqueous colloidal nano composites
C. Dionigi, P. Stoliar, M. Cavallini, F. Biscarini, S. Destri, W. Porzio

53) *Current Applied Physics* **7(1)**, 47-50 (2007) (Web of Science) 0
Properties of thin manganite films grown on semiconducting substrates for spintronics applications
Bergenti I, Dediu V, Cavallini M,, Arisi E, Riminucci A, Taliani C

2006

52) Materials Science and Engineering R. **55** 1-56 (2006). Citazioni (Web of Science) 0
Supramolecular assembly of conjugated materials: from molecular engineering to solid-state properties Ph. Leclère, M. Surin, M.Cavallini, F. Biscarini, R. Lazzaroni

51*) Proceedings of the National Academy of Sciences of the USA* **103,** *17650-17654 (2006).* Citazioni (Web of Science) 0
Self-organisation of Nano-lines and Dots Triggered by a Local Mechanical Stimulus
F. Biscarini, M. Cavallini, R. Kshirsagar, D. A. Leigh, S. León, F. Zerbetto

50) *Advanced Materials 18, 2739-2742 (*2006). Citazioni (Web of Science) 0
Design of amorphous π-conjugated conductors based on polyaniline doped with sulphonic acid functionalized coordination compounds
M. Massi, C. Albonetti, M. Facchini, M. Cavallini and F. Biscarini

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Chiral Amplification Driven Self-Assembly of Enantiopure N,N'-Bis-[2,2']Bithiophen-5-Ylmethyl-ciclohexane-1,2-Diamine in Solid Films
M. Melucci, M. Gazzano, G. Barbarella, M. Cavallini, F. Biscarini, F. Piccinelli, M. Monari, M. Bandini, A. Umani-Ronchi, P. Biscarini

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Ordered Patterning of Nanometric Rings of Single Molecule Magnets on Polymers by Lithographic Control of De Mixing
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47) *Angewandte Chemie International Edition.* **45,** *4779-4882 (2006)* and *Angew. Chem.* **118(29)** *4897-4900 (2006).* Citazioni (Web of Science) 0
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46) The Journal of American Chemical Society **128,** *526-532 (2006).* Citazioni (Web of Science) 5
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2005

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Field Effect Transistors based on Self-Organized Molecular Nano-stripes
M. Cavallini*, P. Stoliar, J.F. Moulin, M. Surin, P. Leclère, R. Lazzaroni, D. W. Breiby, J.W. Andreasen, M. M. Nielsen, P. Sonar, A. C. Grimsdale, K. Müllen, F. Biscarini.

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Structural and magnetic properties of thin manganite films grown on silicon substrates
I. Bergenti, V. Dediu,E.Arisi, M. Cavallini, J.F. Moulin, F. Biscarini, M. De Jong, C. Dennis, J. Gregg

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Electrochemical Fabrication of Cobalt and Nickel Tips for Scanning Tunneling Microscopy
C. Albonetti, M. Cavallini, M. Massi, J. F. Moulin, F. Biscarini

42) Angewandte Chemie International Edition (2005), **44,** 888-892. and *Angew. Chem.* (2005), **117**, 910-914. It has the frontispiece of communications. Citazioni (Web of Science) 14
Magnetic Information Storage on Polymers using Patterned Mn12 Molecules
M. Cavallini, J. Gomez, D. Ruiz, M.. Massi, C. Albonetti, C. Rovira, J. Veciana and F. Biscarini.

2004

41) *Journal of Solid State Chem*. (2004) **177,** 3949-3953. Citazioni (Web of Science) 3
Microwave assisted synthesis of mixed manganese oxide based nanostructures using plastic templates
A.G. Leyva, P. Stoliar, M. Rosenbusch, V. Lorenzo, P. Levy, C. Albonetti, M. Cavallini, F. Biscarini, H.E. Troiani, A.M. Condó, R.D. Sanchez

40) *Synthetic Metals* **146,** (2004), 243-250. Citazioni (Web of Science) 4
FET device performance, morphology and X-ray thin film structure of unsubstituted and modified quinquethiophenes
P. Ostoja, P. Maccagnani, M. Gazzano, M. Cavallini, J.C. Kengne, F. Biscarini, M. Melucci, M. Zambianchi, G. Barbarella

39) Synthetic Metals **146**, (2004), 283-286. Citazioni (Web of Science) 4
Bottom-Up Nanofabrication of Materials for Organic Electronics
Massimiliano Cavallini*, Massimo Facchini, Massimiliano Massi, Fabio Biscarini

*38) *Chem. Mater.* **16,** (2004), 4452-4466. Citazioni (Web of Science) 28
About oligothiophene self-assembly: from aggregation in solution to solid-state nanostructures
Ph. Leclère, M. Surin, P. Viville, R. Lazzaroni, A. F. M. Kilbinger, O. Henze, W. J. Feast, M. Cavallini, F. Biscarini, A. P. H. J. Schenning, E. W. Meijer.

37) Macromolecules **37**(15) 2004, 5692-5702. Citazioni (Web of Science) 8
Non-conjugated poly(α-vinyl,ω-alkyl-thiophene-oligomers): synthesis, fluorescence and morphology
M. Melucci, G. Barbarella, M. Zambianchi, F. Biscarini, M. Cavallini, A. Bongini, M. Mazzeo, G. Gigli

36) *J. Mater. Chem.* **14,** (2004), 1959 – 1963. Citazioni (Scopus) 10
Surface-controlled self-assembly of chiral sexithiophene
P. Leclère, M. Surin, O. Henze, P. Jonkheijm, F. Biscarini, M. Cavallini, W.J. Feast, A.F.M. Kilbinger, R. Lazzaroni, E.W. Meijer, and A.P.H.J. Schenning.

35) *Transactions of the Materials Research Society of Japan,* **29,** (2004), 197-202. Citazioni (Web of Science) 0
Conjugated Material Self-assembly: Towards Supramolecular Electronics
Ph. Leclère, M. Surin, M. Cavallini, P. Jonkheijm, O. Henze, A.P.H.J. Schenning, F. Biscarini, A.C. Grimsdale, W.J. Feast, E.W. Meijer, K. Müllen, J.L. Brédas, and R. Lazzaroni.

34) Phys. Rev. Lett.* **92*, 116802 (2004).* Citazioni (Scopus) 57
Spatially-correlated charge transport in organic thin film transistors
Franco Dinelli, Mauro Murgia, Pablo Levy, M. Cavallini, Fabio Biscarini.

2003

33) Applied Physics Letters* **83 *(2003)* 5286-5288. Citazioni (Web of Science) 21
Parallel Writing by Local Oxidation Nanolithography with sub-Micrometer Resolution
Massimiliano Cavallini, Paolo Mei, Fabio Biscarini Ricardo García,

*32) *Nano Letters* ***3 (11)****, (2003) 1527-1530.* Citazioni (Web of Science) 31
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31) Nano Letters* ***3(9)**, (2003) 1269-1271.* Citazioni (Web of Science) 23
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Massimiliano Cavallini* and Fabio Biscarini

30) Material Science and Engineering C ***23,*** *(2003) 923-925*. Citazioni (Scopus) 4
Fabrication of material patterns by grid-assisted deposition
M. Massi, M. Cavallini, S. Stagni, A. Palazzi. F. Biscarini

29) The Journal of. American Chemical Society* **125, (2003) 10266-10274. Citazioni (Web of Science)31
Multiscale Self-Organization of the Organic Semiconductor α-Quinquethiophene

M. Melucci, M. Gazzano, G. Barbarella, M. Cavallini, F. Biscarini, P. Maccagnani, P. Ostoja

*28) *Thin solid films* (2003), **428,** 227-231. Citazioni (Scopus+ Web of Science) 17
Pentacene self-aggregation at the Au(110)-(1x2) surface: growth morphology and interface electronic states
C. Menozzi, V. Corradini, M. Cavallini, F. biscarini, M. Betti, C. Mariani

*27) *Surface Science* (2003), **532-535,** 249-254. Citazioni (Scopus+ Web of Science) 18
Growth morphology and electronic structure of 2D ordered pentacene on the Au(110)-(1x2) surface V. Corradini, C. Menozzi, M. Cavallini, F. Biscarini, M.G. Betti, C. Mariani.

*26) *Nature Materials* (2003), **2,** 190-195. Citazioni (Web of Science) 93
A Nanoporous Molecular Magnet with reversible Solvent-Induced Mechanical and Magnetic Properties.
D. Maspoch, D. Ruiz-Molina, N. Domingo, K. Wurst, M. Cavallini, F. Biscarini, C. Rovira J. Veciana

*25) *Science* (2003), **299**, 531. Citazioni (Web of Science) 70
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Massimiliano Cavallini, F. Biscarini, S. Léon, F. Zerbetto, G. Bottari, David A. Leigh

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C. Taliani, V. Dediu, F. Biscarini, M. Cavallini, M. Murgia, G. Ruani, P. Nozar

23) Rev. Sci. Instrum.73 (2002) 4254-4256. Citazioni (Web of Science) 1
Electrochemical Preparation of Cobalt Tips for Scanning Tunneling Microscopy
C. Albonetti, I. Bergenti, M. Cavallini*, V. Dediu, M. Massi, J.-F. Moulin and F. Biscarini.

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Characterisation of thin film of CdS deposited on Ag(111) by ECALE. A morphological and photoelectrochemical investigation M. Innocenti, S. Cattarin, M. Cavallini, F. Loglio and M.L. Foresti

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F. Biscarini, M. Cavallini, D. A. Leigh, S.Leon, S.J. Teat J.K. Wong and F. Zerbetto.

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Supramolecular Organization of α,α'-disubstituted Sexithiophenes
A.P.H.J. Schenning, A.F.M. Kilbinger, F. Biscarini, M. Cavallini, H.J. Cooper, P.J. Derrick, W.J. Feast, R. Lazzaroni, Ph. Leclère, L.A. McDonell, E.W. Meijer, and S.C.J. Meskers**.**

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Direct patterning of tris-(8-hydroxyquinoline)-aluminum(III) thin film at submicron scale by modified micro-transfer molding M. Cavallini*, M. Murgia and F. Biscarini

2001
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Conformational self-recognition as the origin of dewetting in bistable molecular surfaces
M. Cavallini, R. Lazzaroni, R.Zamboni, F. Biscarini, D. Timpel, F. Zerbetto, G.J. Clarkson, D. A. Leigh

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Photophysical Properties of thin films and solid phase of switchable supramolecular anthracene-based rotaxanes G. Giro, M.Cocchi, V.Fattori, G. Gadret, G. Ruani, M. Murgia, M. Cavallini, et al.

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M. Cavallini* and F. Biscarini

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*8) *Langmuir* **15,** (1999), 3003-3006. Citazioni (Scopus) 18
An electrochemical STM investigation of 1,8-octanedithiol Self-Assembled Monolayers on Ag(111) in aqueous solution M. Cavallini, M. Bracali, G. Aloisi, R.Guidelli

1998
*7) *The Journal of Electroanalitical Chemistry* **444,** (1998), 75-81. Citazioni(Scopus) 18
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