Prof. EMREN NALBANT

Middle East Technical University
Faculty of Life Sciences, Department of Chemistry
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EDUCATION

8/01–04/06 **Ph.D. in Inorganic and Materials Chemistry**

University of Maryland, College Park, MD, USA
Department of Chemistry and Biochemistry
Advisor: Professor Bryan Eichhorn
Thesis title: "Homoleptic Naked Clusters of Endohedral Zintl Ions"

01/99–01/01 **M.S. in Inorganic and Organometallic Chemistry**

Middle East Technical University, Ankara, Turkey
Department of Chemistry

Advisor: Professor Ceyhan Kayran

Thesis title: "The synthesis and characterization of pentacarbonyl(pyrazine)metal (metal: chromium, molybdenum, tungsten)"

09/92 -06/98 **B.S. in Chemistry Education**

Middle East Technical University, Ankara, Turkey
Department of Chemistry Education

PROFESSIONAL EXPERIENCE

03/20 – present **Professor**, *Middle East Technical University, Faculty of Life Sciences, Department of Chemistry, Ankara, TURKEY.*

02/14 – 03/20 **Associate Professor**, *Middle East Technical University, Faculty of Life Sciences, Department of Chemistry, Ankara, TURKEY.*

06/09 – 02/14 **Assistant Professor**, *Middle East Technical University, Faculty of Life Sciences, Department of Chemistry, Ankara, TURKEY.*

08/06 - 06/09 **Faculty Research Associate**, *University of Maryland, College Park, MD, USA*
Postdoctoral Researcher, *National Institute of Standards and Technology, Gaithersburg, MD, USA*

08/01–01/06 **Research Assistant**, *University of Maryland, College Park, MD, USA*

09/98–01/01 **Research Assistant***, Middle East Technical University, Ankara, Turkey*

PUBLICATIONS

Citations (WoS, as of March 2022): 1011 (total), 975 (w/o self-citation)

h-index: 11

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Publons / ResearcherID: AAF-3477-2022

ScopusID: 6506168620

Fabrication of Highly Catalytically Active Gold Nanostructures on Filter-Paper and Their Applications towards Degradation of Environmental Pollutants
G.A. Khan, E. **Nalbant Esenturk**, A. Bek, A.S. Bhatti, A. Waqqar, *Chemistry Select,* **2021**, 6, 10655.

Electrochemical catechol biosensor based on beta-cyclodextrin capped gold nanoparticles and inhibition effect of ibuprofen
B. Kapan, S. Kurbanoglu, **E. Nalbant Esenturk**, S. Soylemez, L. Toppare, *Process Biochemistry*, **2021**, 108, 80.

Hierarchical microspheres of Co_2CrO_4 nanoplates for electrocatalytic water oxidation,
I. Aksoy, A. Cetin, **E. Nalbant Esenturk**, *Journal of Nanoparticle Research*, **2020**, 22:162.

Hierarchical nanowire and nanoplate -assembled NiCo2O4-NiO biphasic microspheres as effective electrocatalysts for oxygen evolution reaction,
A. Cetin, **E. Nalbant Esenturk**, *Materials Today Chemistry*, **2019**, 14, 100215.

Nanowires assembled from iron manganite nanoparticles: Synthesis, characterization, and investigation of electrocatalytic properties for water oxidation reaction,
A. Cetin, A. M. Onal, **E. Nalbant Esenturk**, *Journal of Materials Research*, **2019**, 34.

Chromium substituted iron oxide nanowires as affordable electrocatalysts for oxygen evolution reaction,
S. Kocabas, A. Cetin, A. M. Onal, **E. Nalbant Esenturk**, *Journal of Nanoparticle Research*, **2019**, 21, 143.

Optical and Vibrational Properties of Nickel Integrated Germanium Zintl Ion Clusters
E. Ogun, O. Esenturk, **E. Nalbant Esenturk**, *Inorganica Chimica Acta*, **2019**, 490, 16.

Magnesium substituted cobalt spinel nanostructures for electrocatalytic water oxidation
E. Ekebas, A. Cetin, A. M. Önal, **E. Nalbant Esenturk**, *Journal of Applied Electrochemistry*, **2019**, 49:315.

Synthesis of tin oxide-coated gold nanostars and evaluation of their surface-enhanced Raman scattering activities
A. Elci, O. Demirtas, I. Murat Ozturk, A. Bek, and **E. Nalbant Esenturk**, *Journalof Materials Science*, **2018**, 53:16345–16356.

Activated carbon-supported CuO nanoparticles: a hybrid material for carbon dioxide adsorption
C. Boruban, **E. Nalbant Esenturk**, *Journal of Nanoparticle Research*, **2018**, 20, 59.

Synthesis of CuO nanostructures on zeolite-Y and investigation of their CO_2 adsorption properties
C. Boruban, **E. Nalbant Esenturk**, *Journal of Materials Research*, **2017**, 32, 3669.

Optical and Vibrational Properties of [Pt@Pb12]2–, [Ni@Pb12]2–, and [Ni@Pb10]2– Zintl Ion Clusters
A. Cetin, O. Esenturk, **E. Nalbant Esenturk**, *European Journal of Inorganic Chemistry*, **2017**, 2017, 2413.

Growth of branched gold nanoparticles on solid surfaces and their use as surface-enhanced Raman scattering substrates
N.I. Evcimen, S.Coskun, D. Kozanoglu, G. Ertas, E. H. Unalan, **E. Nalbant Esenturk**, *RSC Advances*, **2015**, 5, 101656.

A Functional Immobilization Matrix Based on a Conducting Polymer and Functionalized Gold Nanoparticles: Synthesis and Its Application as an Amperometric Glucose Biosensor
M. Kesik, F. E. Kanik, G. Hizalan; D. Kozanoglu, **E. Nalbant Esenturk**, S. Timur, L. Toppare*, Polymer, **2013**, 54, 4463.*

Power Conversion Efficiency Enhancement of Organic Solar Cells by Addition of Gold Nanostars, Nanorods, and Nanospheres
D. Kozanoglu, D. H. Apaydin, A. Cirpan, **E. Nalbant Esenturk**, Org. Electron., *Organic Electronics*, **2013**, 14, 1720.

Gold Nanostar @ Iron Oxide Core-Shell Nanostructures: Synthesis, Characterization and Demonstrated Surface-Enhanced Raman Scattering Properties
E. Nalbant Esenturk, A. Hight-Walker, *J. Nanopart.Res.,* **2013**, 15, 1364.

Gold nanowires with high aspect ratio and morphological purity: Synthesis, characterization, and evaluation of parameters
E. Dertli, S.Coskun, **E. Nalbant Esenturk**, *J. Mater. Res*., **2013**, 28, 250.

Surface Enhaced Raman Scattering Studies via Gold nanostars,
E. Nalbant Esenturk, A. Hight-Walker, *J. Raman Spect.*, **2009**, 40,86.

The Pb_{12}^{2-} and Pb_{10}^{2-} Zintl Ions and the $[M@Pb_{12}]^{2-}$ and $[M@Pb_{10}]^{2-}$ Cluster Series where M = Ni, Pd, Pt,
E. Nalbant Esenturk, J. Fettinger, B. Eichhorn *J. Am. Chem. Soc*, **2006**, 128 (28), 9178.

Synthesis, Structure, and Dynamic Properties of $[Ni_2Sn_{17}]^{4-}$,
E. Nalbant Esenturk, J. Fettinger, B. Eichhorn *J. Am. Chem. Soc.,* **2006,** 128 (1), 12.

Synthesis and characterization of the $[Ni_6Ge_{13}(CO)_5]^{4-}$ and $[Ni_2Ge_9(PPh_3)]^{2-}$ Zintl ion clusters
E. Nalbant Esenturk, J. Fettinger, B. Eichhorn *Polyhedron*, invited paper, **2006,** 25 (2), 521.

The closo-Pb_{10}^{2-} Zintl ion in the $[Ni@Pb_{10}]^{2-}$ cluster,
E. Nalbant Esenturk, J. Fettinger, B. Eichhorn *Chem. Commun*., **2005**, 247.

$Pt@Pb_{12}^{2-}$,
E. Nalbant Esenturk, Y. F. Lim, J. Fettinger, B. Eichhorn *Angew. Chem. Int. Ed.*, **2004**, 43, 2132.

Spectrochemical investigation of pentacarbonyl(pyrazine)metal(0) (metal = Cr, Mo, W),
Ş. Ö. Yaman, **E. Esenturk**, C. Kayran, A. M. Önal *Zeitschrift fuer Naturforschung, B: Chemical Sciences,* **2002**, 57(1), 92.

PRESENTATIONS _____

How big is the small? Nanomaterials of precious gold and earth abundant metals
E. Nalbant Esenturk, Middle East Technical University, Ankara, October 2019.

Nanomalzemeler… Neden bu kadar büyükler?
E. Nalbant Esenturk, 15. Kimya Haftası, Middle East Technical University, Ankara, March 2017. *Invited Talk*

Spinel Metal Oxide Nanoparticles: Synthesis, Characterization and Catalytic Activities towards Water Oxidation
A. Cetin, E. Nalbant Esenturk, Nano TR13, Antalya, Turkey, 22-25 October, 2017.

Synthesis and Characterization of Tin (IV) Oxide Coated Gold Nanoparticles
A. Elçi, E. Nalbant Esenturk, Nano TR13, Antalya, Turkey, 22-25 October, 2017.

Enhancement of photovoltaic performance of PCPDTTBTT:PCBM bulk heterojunction solar cells with inclusion of Gold (Au) nanorods
P. Kavak, N. İ. Evcimen, E. Nalbant Esenturk, E. Alturk. Parlak, OEMT2016 2nd International Conference on Organic Electronic Material Technologies, Çanakkale, Turkey, 2016.

Spectroscopic and Computational Analysis of Transition Metal Integrated Lead Clusters
A. Cetin, E. Nalbant Esenturk, MRS Meeting, Boston, MA, December 2, 2014

Gold Nanowires with High Aspect Ratio and Morphological Purity
E. Nalbant Esenturk, Elcin Dertli, MRS Meeting, Boston, MA, December 2, 2014

Spectroscopic and Computational Analysis of Nickel-Germanium Clusters
E. Nalbant Esenturk, S. Esra Ogun, MRS Meeting, Boston, MA, December 2, 2014.

Anisotropik Şekilli Altın Nanoparçacıklarının Sentezi, Karakterizasyonu ve Fonksiyonlandırılması
E. Nalbant Esenturk, 26. Ulusal Kimya Kongresi, Muğla, October 3 2012.

Production of Very High Aspect Ratio Gold Nanowires in High Yield and Morphological Purity
E. Dertli, E. Nalbant Esenturk, 8. Nanoscience and Nanotechnology Conference *NANOTR*-VIII, Ankara, June 25 *2012*.

Power Conversion Efficiency Enhancement of Organic Solar Cells by Addition of Gold Nanoparticles,
D. Kozanoglu, E. Nalbant Esenturk,8. Nanoscience and Nanotechnology Conference *NANOTR*-VIII, Ankara, June 26 *2012*.

Synthesis Characterization and Functionalization of Gold Nanoparticles,
Z. Sholanbayeva, E. Nalbant Esenturk,8. Nanoscience and Nanotechnology Conference *NANOTR*-VIII, Ankara, June 25 *2012*.

Magnetic Property Integrated Gold Nanostars
E. Nalbant Esenturk, A.R. Hight-Walker, ACS Meeting, Denver, CO, August 27, 2011.

Clusters and Nanoparticles: Synthesis, Characterization and Potential Applications
E. Nalbant Esenturk, Bilkent University, Ankara, April 6, 2010*. Invited Talk*

Gold Nanostars: Substrates for Surface Enhanced Raman Spectroscopy,
E. Nalbant Esenturk, A.R. Hight-Walker, MRS Meeting, San Francisco, CA, April 14, 2009.

Clusters and Nanoparticles: Synthesis, Characterization and Potential Applications
E. Nalbant Esenturk,Middle East Technical University, Ankara, April 2007*. Invited Talk*

Clusters and Nanoparticles: Synthesis, Characterization and Potential Applications
E. Nalbant Esenturk, Boğaziçi University, Ankara, April 2007*. Invited Talk*

Surface Enhanced Raman Activity of Star-shaped Gold Nanoparticles,
E. Nalbant Esenturk, A.R. Hight-Walker, ACS Meeting, New Orleans, LA, April 9, 2008.

Surface Enhanced Raman Spectroscopy via Gold Nanostars,
E. Nalbant Esenturk, A.R. Hight-Walker, Gordon Research Conference, "Clusters, Nanocrystals and Nanostructures", South Hadley, MA, July 29, 2007.

Nanocrystals @ Liposomes: The formation and characterization of quantum dot and anisotropic gold nanoparticle encapsulated liposomes,
E. Nalbant Esenturk, A.R. Hight-Walker, ACS MARM, Collegeville, PA, May 16, 2007.

Assembly and characterization of Nanocomplexes: Quantum Dot encapsulated liposomes,
E. Nalbant Esenturk, A.R. Hight-Walker, Imaging as a Biomarker: Standards for Change Measurements in Therapy Conference, NIST, Gaithersburg, MD, September 14, 2006.

Transition Metal Centered Zintl Ions: Sythesis, Characterization and Potential Applications,
E. Nalbant Esenturk, Award Seminar, Chemistry and Biochemistry Department, University of Maryland, College Park, MD, May 13, 2005.

$[M@Pb_{12}]^{2-}$ (M = Pt, Pd, Ni), $[Ni@Pb_{10}]^{2-}$ and new metal-free Zintl ion clusters,
E. Nalbant Esenturk, B.W. Eichhorn, ACS Meeting, San Diego, CA, March 17, 2005.

Ligand free clusters of transition metal polyplumbide ions as precursors for nanosized catalysts,
E. Nalbant Esenturk, B.W. Eichhorn GRID (Graduate Research Interaction Day), University of Maryland, College Park, MD, April 23, 2004.

Homoleptic, Free-standing Clusters of Transition Metal Polyplumbide Ions,
E. Nalbant Esenturk, B.W. Eichhorn, ACS Meeting, Anaheim, CA, March 30, 2004.

Supported Metal Clusters: Synthesis, Characterization and Catalysis of Tetrairidium Clusters,
E. Nalbant Esenturk, University of Maryland, Chemistry and Biochemistry Department, College Park, MD, May 15, 2003.

TEACHING ACTIVITIES

General Chemistry (CHEM 101, CHEM 102, CHEM 112),
Inorganic Chemistry (CHEM 361, CHEM 362, CHEM 481),
Nanochemistry (CHEM 519)

PROFESSIONAL SERVICE

Referee for the following journals and institutions:

ACS Applied Materials & Interfaces
Analytical Methods
Chemical Communications
Crystal Growth and Design
Langmuir
Micro & Nano Letters
Nanoscale
Nanotechnology
Journal of Applied Electrochemistry
Journal of Nanoparticle Research
Journal of Materials Chemistry C
Journal of Materials Science
Journal of Materials Research
RSC Advances
Turkish Journal of Chemistry

TÜBİTAK (1001, 3501, 3001, 1002, COST programs).
METU Scientific Research Projects Coordination Office (BAP).

AWARDS and AFFILIATIONS

Excellence in Research Award, University of Maryland, Chemistry and Biochemistry Department, USA, 2005
HHMI Fellowship, USA, 2004 - 2006
Prof. Dr. Mustafa Parlar Eğitim ve Araştırma Vakfı, ODTÜ Yılın Eğitimcisi Ödülü, 2016

METU, Micro and Nano Technology Graduate Program
American Chemical Society
Materials Research Society

ADMINISTRATIVE ACTIVITIES

Advisor to the Chair, METU Dept. of Chemistry (2021-present)

METU Dept. of Chemistry, Doctoral Comprehensive Board Member (2021-present)

METU Dept. of Chemistry, Education Board Member (2021-present)

ENDAM (Enerji Malzemeleri ve Depolama Cihazları Araştırma Merkezi) Management Board Member (2019-present)

MSc THESIS: Supervisor _____

Synthesis of Nickel and Cobalt Based Nanoparticles on Surfaces for Photoelectrochemical Splitting of Water
Aleyna Yaşar, (2021- present)

Synthesis of Magnesium and Cobalt Based Spinel Nanoparticles and Investigation of Their Potential Application as Catalyst in Water Splitting
Emine Ecem Nas, (2021- present)

Synthesis of Iron and Nickel Based Metal Oxide Nanoparticles and Investigation of Their Potential Use as Catalyst in Water Oxidation Reaction
Büşra Atak, (2021- present)

Synthesis of Iron-Based Metal Oxide Nanoparticles and Investigation of Their Potential Utility in Supercapacitors
Almila Nur Gözütok, (2021- present)

Synthesis of Gold Nanoparticles and Investigation of Their Potential Applications
Duygu Gümüş, (2021- present)

Synthesis of Cobalt Based Metal Oxide Nanoparticles and Investigation of Their Use as Catalyst in Water Oxidation Reaction
İzel Aksoy, (2018 – 2022).

Synthesis, Characterization and Catalytic Investigation of Catalytic Investigation of Iron Based Nano-Catalysts for Water Oxidation Reaction
Serra Kocabaş, (2018-2022)

Synthesis and Characterization of Nickel Zinc Oxide Nanoparticles and Their Investigation as Water Oxidation Catalyst
Yağmur Ağcalı, (2018-2020)

Semiconductor Coated Gold Nanoparticles: Synthesis, Charaacterization and Investigation of Potential Applications
Aylin Elçi, (2015 -2017)

Carbondioxide Capture by Copper Oxide Nanoparticles Decorated Supports
Cansu Börüban, (2013-2016)

Growth and Characterization of Branched Gold Nanoparticles on Surfaces
Nimet İlkem Evcimen, (2013 -2014)

Synthesis , spectroscopic and computational analysis of nickel integrated Germanium Clusters
Sinem Esra Öğün, (2012 – 2014)

Synthesis of Gold Nanowires with High Aspect Ratio and Morphological Purity,
Elçin Dertli, (2010 - 2012)

Power Conversion Efficiency Enhancement of Organic Solar Cells by Addition of Gold Nanoparticles,
Duygu Kozanoglu, (2010 - 2012)

Synthesis Characterization and Functionalization of Gold Nanoparticles,
Zhanar Sholanbayeva, (2010 - 2012)

MSc THESIS: Co-advisor _____

Production and Characterization of Nano Silver Oxide For Silver-Zinc Batteries
Özüm Öyküm Yurtseven, (2011-2013)

Optical Detection of Artificial Cellular Evolution
Şeyma Ünsal, (2012-2014)

Synthesis and Characterization of New Co2013nducting Polymer-Nano Particle Composites
Esra Eroğlu, (2010-2012)

PhD THESIS: Supervisor

Synthesis of First Row Transition Metal Oxide Nanomaterials fir Electrocatalytic Water Oxidation Reaction
Asude Çetin, (2012 – 2020).

PhD THESIS: Co-advisor

Carbon Encapsulated Nanoparticles for Rechargeable Batteries
Aylin Elçi *(MNT Program)*, (2018- present)

Enhanced Raman Spectroscopy with Laser Processed Tips
Özge Demirtaş *(MNT Program)*, (2018- present)

PROJECTS

"Kuantum Girişim Artırımlı Raman Spektroskopisi (QUPERS)"
TÜBİTAK 1001, 19F101, 11.2019-present, Researcher

"Nikel temelli çiftmetal oksit nanomalzemelerin sentezlenmesi ve suyun elektrokimyasal ayrıştırılmasındaki etkinliklerinin incelenmesI"
ODTÜ, GAP-103-2021-10606, 02.2021-022022, Project Manager

"Spinel Yapıda Yeni Nano-Katalizörlerin Sentezi ve Temiz Enerji Üretimi için Suyun Yükseltgenmesindeki Kullanımlarının İncelenmesi"
TÜBİTAK 1001, *117Z384*, 10.2017-10.2019, Project Manager

"Lüminesan MCM-41 Mezogözenekli Silika Nanoparçacıklarına Selekoksib Yükleme Çalışmaları: İlaç Yükleme ve Bırakma Özellikleri"
ODTÜ, GAP-103-2018-2751, 05.2018-02.2019, Researcher

"Değişik destek malzememleri kullanılarak yeni katalizörlerin hazırlanması"
ODTÜ, BAP-01-03-2017-004, 01.2017-12.2017, Researcher

"Serya destekli rutenyum nanokümeleri: Sentezi, tanımlanması ve amonyak boranın hdirolizinden hidrojen üretiminde katalitik etkinliğinin incelenmesi"
ODTÜ, BAP-01-03-2016-005, 01.2016-12.2016, Researcher

"Hidrojen Üretiminde Formik Asidin Dehidrojenlenmesini Katalizleyecek Metal Nanokümelerinin Hazırlanması, Tanımlanması ve Katalitik Performanslarının İncelenmesi"
ODTÜ, BAP-01-03-2015-004, 01.2015-12.2015, Researcher

"Biyomedikal Amaçla Kullanılabilecek Anorganik Nanoparçacıkların Yüzey Aktifleme Çalışmaları ve Bunların Fizikokimyasal Karakterizasyonları"
ODTÜ, BAP-01-03-2014-001, 01.2013 - 12.2013, Researcher

"Ana Grup Kümelerinden Nanomalzemelere: Sentez, Karakterizasyon, Birleştirme"
TÜBİTAK 3501, 211T083, 05.2012-05.2014, Project Manager

“Altın Çekirdek, Gümüş Kabuk Bimetalik Nanoparçacıkların Sentezi ve Karakterizasyonu”
ODTÜ, BAP-08-11-2013-036, 01.2013 - 12.2013, Project Manager

“*Fonksiyonel Özellikleri Güçlendirilmiş Soymetal Nano Parçacıklarının Sentezi ve Uygulama Alanlarının İncelenmesi”*
ODTÜ, BAP-01-03-2011-004, 01.2011-12.2011, Project Manager

“Altın, Gümüş nanoparçacıklarının sentezi ve karakterizasyonu”
ODTÜ, BAP-08-11-2010-110, 01.2010-12.2010, Project Manager