

# Prof. GÜRKAN KARAKAŞ

## Personal Information

**Email:** gkarakas@metu.edu.tr

**Web:** <https://avesis.metu.edu.tr/gkarakas>

## Education Information

Doctorate, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, Turkey 1989 - 1995

Postgraduate, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, Turkey 1985 - 1988

Undergraduate, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, Turkey 1980 - 1985

## Research Areas

Technical Sciences, Chemical Engineering and Technology, Process and Reactor Design, Chemical Reaction Engineering, Catalysis and Catalytic Processes, Basic Sciences, Chemistry, Physical Chemistry, Surface Chemistry

## Academic Titles / Tasks

Professor, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2006 - Continues

Associate Professor, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2001 - 2006

Assistant Professor, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 1999 - 2001

Lecturer, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 1998 - 1998

Research Assistant, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 1980 - 1995

## Academic and Administrative Experience

Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2007 - 2010

Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 1998 - 2004

## Advising Theses

KARAKAŞ G., Effect of synthesis parameters on structural properties and thermal behavior of sol-gel synthesized iron oxide xerogels, Doctorate, N.EZGİ(Student), 2018

KARAKAŞ G., ULUDAĞ Y., Mathematical and computational modelling of chemical heat pumps, Postgraduate, T.GÜNEŞ(Student), 2018

KARAKAŞ G., Catalyst screening for complete oxidation of nitrogen containing compounds, Postgraduate,

A.SEVİNÇ(Student), 2017

KARAKAŞ G., Synthesis of CNT-titania-silica nanocomposite thin films: The effect of heat treatment on photocatalytic activity, Postgraduate, T.KIRBAŞ(Student), 2014

KARAKAŞ G., Electrodeposition of ZnO thin films: Effect of vanadium doping, Postgraduate, C.AVŞAR(Student), 2013

YÜCEL H., KARAKAŞ G., Comparison of sorption capacities of hydrocarbons on different samples of MCM-41, Postgraduate, B.AYDOĞDU(Student), 2013

YÜCEL H., KARAKAŞ G., Comparison of sorption capacities on different samples of MCM-41, Postgraduate, B.Aydoğdu(Student), 2013

BÖLÜKBAŞI U., KARAKAŞ G., Photocatalytic antimicrobial and self-cleaning properties of titania-silica mixed oxide thin films, Doctorate, B.Korkmaz(Student), 2012

KARAKAŞ G., Photocatalytic antimicrobial and self-cleaning properties of titania-silica mixed oxide thin films, Doctorate, B.KORKMAZ(Student), 2012

KARAKAŞ G., Sensitization of sol-gel derived titania-silica photocatalytic thin films with ascorbic acid, Postgraduate, E.YILMAZ(Student), 2012

ÖGEL B., KARAKAŞ G., The photocatalytic activity of praseodymium doped titanium dioxide, Doctorate, D.DOĞU(Student), 2012

KARAKAŞ G., ULUDAĞ Y., Mathematical modeling of adsorption/desorption systems for chemical heat pumps, Postgraduate, A.ONUR(Student), 2011

KARAKAŞ G., Analysis of phenol oxidation products by *Scytalidium thermophilum* bifunctional catalase/phenol oxidase (CATPO), Doctorate, G.AVCI(Student), 2011

HAMAMCI H., KARAKAŞ G., Production of lactic acid esters by reactive distillation, Postgraduate, Ö.YALÇIN(Student), 2011

KARAKAŞ G., Low temperature photocatalytic oxidation of carbon monoxide over palladium doped titania catalysts, Postgraduate, P.YETİŞEMİYEN(Student), 2010

YÜCEL H., KARAKAŞ G., Sorption of C8 aromatics on MCM-41, Postgraduate, B.ALİ(Student), 2010

KARAKAŞ G., Photocatalytic activity of titania-silica mixed oxides prepared with co-hydrolyzation, Postgraduate, B.BAYRAM(Student), 2009

VOLKAN M., KARAKAŞ G., Preparation and characterization of titania-silica-gold thin films over its substrates for laccase immobilization, Postgraduate, Z.EKER(Student), 2009

KARAKAŞ G., The synthesis of titanium dioxide photocatalysts by sol-gel method: The effect of hydrothermal treatment conditions and use of carbon nanotube template, Doctorate, A.YÜRÜM(Student), 2009

KARAKAŞ G., Enzyme immobilization on titania-silica-gold thin films for biosensor applications and photocatalytic enzyme removal for surface patterning, Postgraduate, M.ÇINAR(Student), 2009

KARAKAŞ G., Application of semiconductor films over glass/ceramic surfaces and their low temperature photocatalytic activity, Postgraduate, T.İRFAN(Student), 2009

PARLAK M., KARAKAŞ G., PRODUCTION OF TITANIUM DIOXIDE THIN FILMS WITH IMPROVED PHOTOCATALYTIC ACTIVITY: THE USE OF BACTERIA AS 3D TEMPLATES, Postgraduate, B.KOÇ(Student), 2009

KARAKAŞ G., Carbon monoxide oxidation under oxidizing and reducing conditions with alkali-metal and palladium doped tin dioxide, Doctorate, B.MİRKELEMOĞLU(Student), 2006

KARAKAŞ G., Dynamic resistivity behavior of thin oxide based multilayer thin films under reducing conditions, Postgraduate, B.Kurbanoğlu(Student), 2006

KARAKAŞ G., Dynamic resistivity behavior of tin oxide based multilayer thin films under reducing conditions, Postgraduate, B.KURBANOĞLU(Student), 2006

HAMAMCI H., KARAKAŞ G., Partial removal of proteins from lactic acid broth and recovery of proteins from brewery wastes by foam fractionation technique, Postgraduate, L.KURT(Student), 2006

KARAKAŞ G., Investigation of thin semiconductor coatings and their antimicrobial properties, Postgraduate, A.Erkan(Student), 2005

KARAKAŞ G., Kinetics of methyl lactate formation over the ion exchange resin catalysts, Postgraduate, S.AKBELLEN(Student), 2004

KARAKAŞ G., YILMAZ L., Screening and characterization of catalytic composite membranes for ethyl lactate production, Postgraduate, Ö.OĞUZER(Student), 2004

KARAKAŞ G., Parametric studies on cell flotation of Mazıdağı phosphate rock, Postgraduate, E.ÖZTİN(Student), 2003  
 KARAKAŞ G., YILMAZ L., Ethyl lactate production by hybrid processes: Determination of phase diagrams and evaluation of performance of organophilic pervaporation membranes, Postgraduate, M.İNAL(Student), 2003  
 KARAKAŞ G., Design and construction of a flotation column, Postgraduate, Ç.ÇAĞDAŞ(Student), 2002  
 KARAKAŞ G., Dynamic resistivity behavior of tin oxide based thick films under reducing and oxidizing conditions, Postgraduate, I.SEVERCAN(Student), 2002  
 KARAKAŞ G., Dynamic resistivity behavior of tin oxide based thick films under reducing and oxidizing conditions, Postgraduate, I.Severcan(Student), 2002  
 KARAKAŞ G., Investigation of carbon monoxide oxidation over tin dioxide based catalysts by dynamic methods., Postgraduate, B.MİRKELAMOĞLU(Student), 2002  
 YILMAZ L., KARAKAŞ G., Ethyl lactate production by hybrid processes: Evaluation of performance of hydrophilic pervaporation membranes for ethyl lactate-water-ethanol mixtures, Postgraduate, S.KORKUT(Student), 2001  
 KARAKAŞ G., Characterization of adsorption and chemisorption of permanent gases over metal supported oxide powders with magnetic permeability, Postgraduate, S.BEKTESEVİC(Student), 2000

### Articles Published in Journals That Entered SCI, SSCI and AHCI Indexes

- I. **Effect of Drying Conditions on the Characteristics and Performance of B/Fe<sub>2</sub>O<sub>3</sub> Nano-Composites Prepared by Sol-Gel Method**  
 Yilmaz N. E. D. , KARAKAŞ G.  
 CENTRAL EUROPEAN JOURNAL OF ENERGETIC MATERIALS, vol.17, no.1, pp.85-106, 2020 (Journal Indexed in SCI)
- II. **Methylene Blue Degradation on Praseodymium-Doped Titanium Dioxide Photocatalyst**  
 Dogu D., KARAKAŞ G.  
 JOURNAL OF THE FACULTY OF ENGINEERING AND ARCHITECTURE OF GAZI UNIVERSITY, vol.35, no.2, pp.859-869, 2020 (Journal Indexed in SCI)
- III. **Catalytic oxidation of nitrogen containing compounds for nitrogen determination**  
 KARAKAŞ G., SEVİNÇ A.  
 CATALYSIS TODAY, vol.323, pp.159-165, 2019 (Journal Indexed in SCI)
- IV. **Photocatalytic properties and characterization of praseodymium-doped titanium dioxide**  
 DOĞU D., KARAKAŞ G.  
 Journal of Advanced Oxidation Technologies, vol.21, no.1, 2018 (Journal Indexed in SCI Expanded)
- V. **Synthesis of Na-, Fe-, and Co-promoted TiO<sub>2</sub>/multiwalled carbon nanotube composites and their use as a photocatalyst**  
 Yurum A., KARAKAŞ G.  
 TURKISH JOURNAL OF CHEMISTRY, vol.41, no.3, pp.440-454, 2017 (Journal Indexed in SCI)
- VI. **Photocatalytic antibacterial activity of TiO<sub>2</sub>-SiO<sub>2</sub> thin films: The effect of composition on cell adhesion and antibacterial activity**  
 ERDURAL B., Bolukbasi U., KARAKAŞ G.  
 JOURNAL OF PHOTOCHEMISTRY AND PHOTOBIOLOGY A-CHEMISTRY, vol.283, pp.29-37, 2014 (Journal Indexed in SCI)
- VII. **Room Temperature Photocatalytic Oxidation of Carbon Monoxide Over Pd/TiO<sub>2</sub>-SiO<sub>2</sub> Catalysts**  
 KARAKAŞ G., Yetisemiyen P.  
 TOPICS IN CATALYSIS, vol.56, pp.1883-1891, 2013 (Journal Indexed in SCI)
- VIII. **Modeling and computational simulation of adsorption based chemical heat pumps**  
 YURTSEVER A. O. , KARAKAŞ G., ULUDAĞ Y.  
 APPLIED THERMAL ENGINEERING, vol.50, no.1, pp.401-407, 2013 (Journal Indexed in SCI)
- IX. **Electrical and catalytic properties of SnO<sub>2</sub>/TiO<sub>2</sub> measured in operando conditions**  
 MUNTEANU C., CALDARARU M., BRATAN V., YETISEMIYEN P., KARAKAŞ G., IONESCU N. I.  
 REACTION KINETICS MECHANISMS AND CATALYSIS, vol.105, no.1, pp.13-22, 2012 (Journal Indexed in SCI)
- X. **Production of a novel bifunctional catalase-phenol oxidase of *Scytalidium thermophilum* in the**

**presence of phenolic compounds**

YUZUGULLU Y., Ogel Z. B. , BOLUKBASI U. B. , ÇORUH N., KARAKAŞ G.

TURKISH JOURNAL OF BIOLOGY, vol.35, no.6, pp.697-704, 2011 (Journal Indexed in SCI)

- XI. **Synthesis and characterization of Ba/MCM-41**  
Kaya E., Oktar N., KARAKAŞ G., Murtezaoglu K.  
TURKISH JOURNAL OF CHEMISTRY, vol.34, no.6, pp.935-943, 2010 (Journal Indexed in SCI)
- XII. **Antimicrobial properties of TiO<sub>2</sub>-SiO<sub>2</sub> thin films**  
Erdural B. K. , KARAKAŞ G., Bakir U., SULUDERE Z., Suludere D.  
NEW BIOTECHNOLOGY, vol.25, 2009 (Journal Indexed in SCI)
- XIII. **Hydrothermal synthesis of nanostructured TiO<sub>2</sub> particles and characterization of their photocatalytic antimicrobial activity**  
ERDURAL B. K. , YÜRÜM A., BAKIR U., KARAKAŞ G.  
JOURNAL OF NANOSCIENCE AND NANOTECHNOLOGY, vol.8, no.2, pp.878-886, 2008 (Journal Indexed in SCI)
- XIV. **A special issue - Selected peer reviewed articles from NANOMAT 2006 - International Workshop on Nanostructured Materials, June 21-23, 2006, Antalya, Turkey**  
Oezenbas M., TURAN R., Karakas G.  
JOURNAL OF NANOSCIENCE AND NANOTECHNOLOGY, vol.8, no.2, pp.467-468, 2008 (Journal Indexed in SCI)
- XV. **Photocatalytic microbial inactivation over Pd doped SnO<sub>2</sub> and TiO<sub>2</sub> thin films**  
ERKAN A., BAKIR U., Karakas G.  
JOURNAL OF PHOTOCHEMISTRY AND PHOTOBIOLOGY A-CHEMISTRY, vol.184, no.3, pp.313-321, 2006 (Journal Indexed in SCI)
- XVI. **The role of alkali-metal promotion on CO oxidation over PdO/SnO<sub>2</sub> catalysts**  
MİRKELAMOĞLU B., Karakas G.  
APPLIED CATALYSIS A-GENERAL, vol.299, pp.84-94, 2006 (Journal Indexed in SCI)
- XVII. **CO oxidation over palladium- and sodium-promoted tin dioxide: catalyst characterization and temperature-programmed studies**  
MİRKELAMOĞLU B., Karakas G.  
APPLIED CATALYSIS A-GENERAL, vol.281, pp.275-284, 2005 (Journal Indexed in SCI)
- XVIII. **Production of lactic acid esters catalyzed by heteropoly acid supported over ion-exchange resins**  
AYTURK E., HAMAMCI H., Karakas G.  
GREEN CHEMISTRY, vol.5, no.4, pp.460-466, 2003 (Journal Indexed in SCI)
- XIX. **In situ DRIFTS characterization of wet-impregnated and sol-gel Pd/TiO<sub>2</sub> for NO reduction with CH<sub>4</sub>**  
Karakas G., Mitome-Watson J., Ozkan U. S.  
Catalysis Communications, vol.3, no.5, pp.199-206, 2002 (Journal Indexed in SCI)
- XX. **Reaction network of indole hydrodenitrogenation over NiMoS/γ-Al<sub>2</sub>O<sub>3</sub> catalysts**  
BUNCH A., ZHANG L., Karakas G., Ozkan U. S.  
Applied Catalysis A: General, vol.190, pp.51-60, 2000 (Journal Indexed in SCI)
- XXI. **NiMoS/gamma-Al<sub>2</sub>O<sub>3</sub> catalysts: The nature and the aging behavior of active sites in HDN reactions**  
ZHANG L. P. , Karakas G., OZKAN U. S.  
JOURNAL OF CATALYSIS, vol.178, no.2, pp.457-465, 1998 (Journal Indexed in SCI)
- XXII. **Supercritical fluid extraction and temperature-programmed desorption of phenol and its oxidative coupling products from activated carbon**  
HUMAYUN R., Karakas G., Dahlstrom P., OZKAN U. S. , TOMASKO D. L.  
INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH, vol.37, no.8, pp.3089-3097, 1998 (Journal Indexed in SCI)
- XXIII. **Effect of H<sub>2</sub>O and SO<sub>2</sub> on the activity of Pd/TiO<sub>2</sub> catalysts in catalytic reduction of NO with methane in the presence of oxygen**  
MITOME J., Karakas G., Bryan K. A. , Ozkan U. S.  
Catalysis Today, vol.42, pp.3-11, 1998 (Journal Indexed in SCI)
- XXIV. **Characterization and temperature-programmed studies over Pd/TiO<sub>2</sub> catalysts for NO reduction with methane**  
Ozkan U. S. , Kumthekar M. W. , Karakas G.

- Catalysis Today, vol.40, no.1, pp.3-14, 1998 (Journal Indexed in SCI)
- XXV. **Reactivity of CO<sub>2</sub> during thermal cracking of heavy paraffins under supercritical conditions**  
Karakas G., Dogu T., Somer T.  
INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH, vol.36, no.11, pp.4445-4451, 1997 (Journal Indexed in SCI)
- XXVI. **Self-sustained oscillatory behavior of NO+CH<sub>4</sub>+O<sub>2</sub> reaction over titania-supported Pd catalysts**  
OZKAN U., KUMTHEKAR M., Karakas G.  
JOURNAL OF CATALYSIS, vol.171, no.1, pp.67-76, 1997 (Journal Indexed in SCI)
- XXVII. **AN EXPERIMENTAL INVESTIGATION OF POLYVINYL-CHLORIDE) EMULSION POLYMERIZATION - EFFECT OF INITIATOR AND EMULSIFIER CONCENTRATIONS ON POLYMERIZATION KINETICS AND PRODUCT PARTICLE-SIZE**  
KARAKAS G., ORBEY N.  
BRITISH POLYMER JOURNAL, vol.21, no.5, pp.399-406, 1989 (Journal Indexed in SCI)

### Refereed Congress / Symposium Publications in Proceedings

- I. **Effect of Proton Scavengers on the Textural Properties and Performance of Fe<sub>2</sub>O<sub>3</sub> Xerogels for BoronContaining Pyrotechnics**  
YILMAZ N. E. D. , KARAKAŞ G.  
53rd AIAA/SAE/ASEE Joint Propulsion Conference, ATLANTA, United States Of America, 10 - 12 July 2017
- II. **SYNTHESIS OF CNT TiO<sub>2</sub> SiO<sub>2</sub> NANOCOMPOSITE THINFILMS THE EFFECT OF HEAT TREATMENT ONPHOTOCATALYTIC ACTIVITY**  
KARAKAŞ G., TUĞÇE K.  
NCC 6 CATALYSIS CONFERENCE, 6. KATALİZ KONGRESİ, Turkey, 27 - 30 April 2016
- III. **Catalyst For Complete Oxidation of Nitrogen Containing Samples**  
KARAKAŞ G., ATAMER B., SEVİNÇ A.  
10th EUROPEAN CONGRESS OF CHEMICAL ENGINEERING, 27 September - 01 October 2015
- IV. **Effect of carbon nanotube templates and, sodium, iron and cobalt doping on the photocatalytic activity of sol-gel synthesized titania for water treatment**  
Yurum A., KARAKAŞ G.  
11th International Biorelated Polymer Symposium / 243rd National Spring Meeting of the American-Chemical-Society (ACS), California, United States Of America, 25 - 29 March 2012, vol.243
- V. **ANTIMICROBIAL PROPERTIES OF TITANIUM NANOPARTICLES**  
ERDURAL B. K. , YURUM A., BAKIR U., KARAKAŞ G.  
NATO Advanced Study Institute on Functionalized Nanoscale Materials, Devices and Systems for Chem-Bio Sensors, Photonics and Energy Generation and Storage, Sinaia, Romania, 4 - 15 June 2007, pp.409-414
- VI. **Low temperature oxidation of carbon monoxide over alkali-metal promoted palladium-tin oxide catalysts**  
MİRKELAMOĞLU B., KARAKAŞ G.  
NATO Advanced Research Workshop on Surface Chemistry in Biomedical and Environmental Science, Kiev, Ukraine, 14 - 17 September 2005, vol.228, pp.359-361

### Supported Projects

- KARAKAŞ G., Project Supported by Higher Education Institutions, ATIK SUDA FOSFORLU BİLEŞİKLERİN GİDERİMİ İÇİN Fe<sub>2</sub>O<sub>3</sub> ZEROJEL VE AEROJEL SENTEZİ VE KARAKTERİZASYONU, 2017 - 2017
- KARAKAŞ G., GÖZDE E., Project Supported by Higher Education Institutions, METAL KLORÜRLERİN DERİN ÖTEKTİK SIVILAR İLE ÇÖZELTİ VE SÜSPANSİYONLARINDA AMONYAK İLE TEPKİME KİNETİĞİNİN İNCELENMESİ, 2017 - 2017
- KARAKAŞ G., Project Supported by Higher Education Institutions, AZOTLU ORGANİK BİLEŞİKLERİN YÜKSEK SICAKLIKTA Pt/Fe<sub>2</sub>O<sub>3</sub> ve CuO/Fe<sub>2</sub>O<sub>3</sub> KATALİZÖRLERİ İLE KATALİTİK OKSİDASYONU, 2015 - 2015

KARAKAŞ G., Project Supported by Higher Education Institutions, FOTOKATALİTİK UYGULAMALAR İÇİN TiO<sub>2</sub>-SiO<sub>2</sub> KARIŞIM OKSİTLERİNİN İLETKEN OKSİT KAPLI CAM ÜZERİNE ELEKTROFOREZ METODU İLE KAPLANMASI, 2013 - 2014

BÖLÜKBAŞI U., KARAKAŞ G., Project Supported by Higher Education Institutions, Dik Hizalanmış Karbon Nanotüplerin Şablon Olarak Kullanılmasıyla Elde Edilen Titanyum Dioksit Filmlerin Fotokatalitik Aktivitesi, 2012 - 2013

KARAKAŞ G., Project Supported by Higher Education Institutions, Antioksidanlar Elektron Tutuklayıcılar Kullanılarak Fotokatalitik Hidrojen Üretimi, 2011 - 2011

KARAKAŞ G., Project Supported by Higher Education Institutions, Tek Basamaklı Tepkime-Ayrıştırma Sisteminde Etil Laktat Üretimi, 2010 - 2010

KARAKAŞ G., Project Supported by Higher Education Institutions, Suyun Ve Etil Alkol Çözeltilerinin Fotokatalitik İndirgenmesi Yoluyla Hidrojen Üretimi, 2010 - 2010

## Citations

Total Citations (WOS):540

h-index (WOS):13