

## **Prof. Güldem Kartal Şireli**

### **Personal Information**

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### **International Researcher IDs**

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ScopusID: 55532583300

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### **Education Information**

Doctorate, Istanbul Technical University, Fen Bilimleri Enstitüsü, Malzeme Bilimi Ve Mühendisliği (YI) (Tezli), Turkey  
2004 - 2012

Postgraduate, Istanbul Technical University, Fen Bilimleri Enstitüsü, Malzeme Bilimi Ve Mühendisliği (YI) (Tezli), Turkey  
2002 - 2004

Undergraduate, Istanbul Technical University, Kimya-Metalurji Fakültesi, Metalurji Ve Malzeme Mühendisliği Bölümü,  
Turkey 1997 - 2002

### **Foreign Languages**

English

### **Dissertations**

Doctorate, Katodik redüksiyon-termal difüzyon yöntemi ile metallerin borlanması (KRTD-bor) ve süreçlerin optimizasyonu, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Malzeme Bilimi Ve Mühendisliği (YI) (Tezli), 2012  
Postgraduate, Ergimiş tuz elektroliz yöntemiyle çeliklerin borlanması ve proses parametrelerinin optimizasyonu, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Malzeme Bilimi Ve Mühendisliği (YI) (Tezli), 2004

### **Research Areas**

Technical Sciences, Metallurgical and Materials Engineering, Material science and engineering, Chemical and Electrochemical Properties, Corrosion and Corrosion Protection, Plating, Production Metallurgy, Electrolytic Coating, Electrometallurgy, Recycling Processes, Hydrometallurgy, Pyrometallurgy

### **Academic Titles / Tasks**

Associate Professor, Istanbul Technical University, Kimya-Metalurji, Metalurji Ve Malzeme Mühendisliği, 2016 - Continues

Research Assistant PhD, Istanbul Technical University, Fen Bilimleri Enstitüsü, 2012 - 2016

Research Assistant, Istanbul Technical University, Fen Bilimleri Enstitüsü, İleri Teknolojiler Anabilim Dalı, 2002 - 2012

## Academic and Administrative Experience

Fakülte Yönetim Kurulu Üyesi, Istanbul Technical University, Kimya-Metalurji, 2019 - Continues

Deputy Head of Department, Istanbul Technical University, Kimya-Metalurji, Metalurji Ve Malzeme Mühendisliği, 2018 - 2020

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Improving the Surface Performance of Discarded AISI T1 Steel by Cathodic Reduction and Thermal Diffusion-Based Boriding**  
Kartal Şireli G., Yuce H., Arslan M., Karimzadehkhoei M., Timur S. İ.  
Journal of Materials Engineering and Performance, vol.32, no.21, pp.9504-9514, 2023 (SCI-Expanded)
- II. **An experimental and modelling study on pulse current integrated CRTD-Bor process**  
Arslan Kaba M., Karimzadehkhoei M., Keddami M., Timur S. İ., Kartal Şireli G.  
Materials Chemistry and Physics, vol.302, 2023 (SCI-Expanded)
- III. **Alternative approach for the growth of a TiB<sub>2</sub>/TiC multilayer on M2 steel using the duplex method: Cathodic arc physical vapor deposition and cathodic reduction and thermal diffusion boriding**  
Karimzadehkhoei M., Kaçar E., Timur S. İ., Ürgen M. K., Kartal Şireli G.  
Journal of Vacuum Science and Technology A: Vacuum, Surfaces and Films, vol.41, no.4, 2023 (SCI-Expanded)
- IV. **Investigating Growth of Iron Borides with the Formation of Monolithic Fe<sub>2</sub>B Layer on AISI 304 Stainless Steel via Cathodic Reduction and Thermal Diffusion-Based Boriding**  
Arslan M., Karimzadehkhoei M., Kartal Şireli G., Coskun O. K., Sert M., Timur S.  
JOURNAL OF MATERIALS ENGINEERING AND PERFORMANCE, vol.31, no.4, pp.3274-3286, 2022 (SCI-Expanded)
- V. **Evaluation of pulse current integrated CRTD-Bor for boron diffusion in low carbon steel**  
Arslan M., Coşkun O. K., Karimzadehkhoei M., Kartal Şireli G., Timur S.  
MATERIALS LETTERS, vol.308, 2022 (SCI-Expanded)
- VI. **Investigation on structural and tribological properties of borided gear steel after phase homogenization**  
Arslan M., Ok A. C., Kartal Şireli G., Timur S.  
SURFACE & COATINGS TECHNOLOGY, vol.429, 2022 (SCI-Expanded)
- VII. **Evaluating the mechanical behavior of electrochemically borided low-carbon steel**  
Kartal Şireli G., Bora A. S., Timur S.  
SURFACE & COATINGS TECHNOLOGY, vol.381, 2020 (SCI-Expanded)
- VIII. **One-step electrochemical reduction of stibnite concentrate in molten borax**  
Kartal L., Daryal M. B., Kartal Şireli G., Timur S.  
INTERNATIONAL JOURNAL OF MINERALS METALLURGY AND MATERIALS, vol.26, no.10, pp.1258-1265, 2019 (SCI-Expanded)
- IX. **Surface modification of chromium-silicon martensitic steel by forming hard borides**  
Kartal Şireli G., Ozkalafat P., Timur S.  
SURFACE & COATINGS TECHNOLOGY, vol.326, pp.18-27, 2017 (SCI-Expanded)
- X. **Effects of wire-electro discharge machining process on surface integrity of WC-10Co alloy**  
Şireli E., Orhon N., Kartal Şireli G.  
INTERNATIONAL JOURNAL OF REFRACTORY METALS & HARD MATERIALS, vol.64, pp.190-199, 2017 (SCI-Expanded)
- XI. **Electrodeposition of titanium diboride from oxide based melts**  
Ozkalafat P., SIRELİ G., Timur S. İ.

- Surface and Coatings Technology, vol.308, pp.128-135, 2016 (SCI-Expanded)
- XII. **An investigation of ruthenium coating from LiCl-KCl eutectic melt**  
Sireli G.  
APPLIED SURFACE SCIENCE, vol.317, pp.294-301, 2014 (SCI-Expanded)
- XIII. **An investigation of copper and selenium recovery from copper anode slimes**  
Kilic Y., KARTAL G., Timur S. İ.  
INTERNATIONAL JOURNAL OF MINERAL PROCESSING, vol.124, pp.75-82, 2013 (SCI-Expanded)
- XIV. **Evaluation of electrochemical bonding of Inconel 600**  
Sista V., KAHVECIOGLU O., KARTAL G., ZENG Q. Z., KIM J. H., ERYILMAZ O. L., ERDEMİR A.  
SURFACE & COATINGS TECHNOLOGY, vol.215, pp.452-459, 2013 (SCI-Expanded)
- XV. **Growth kinetics of titanium borides produced by CRTD-Bor method**  
Kartal G., Timur S. İ.  
SURFACE & COATINGS TECHNOLOGY, vol.215, pp.440-446, 2013 (SCI-Expanded)
- XVI. **The growth of single Fe<sub>2</sub>B phase on low carbon steel via phase homogenization in electrochemical boriding (PHEB)**  
Kartal G., Timur S. İ., SISTA V., ERYILMAZ O. L., ERDEMİR A.  
SURFACE & COATINGS TECHNOLOGY, vol.206, no.7, pp.2005-2011, 2011 (SCI-Expanded)
- XVII. **Kinetics of electrochemical boriding of low carbon steel**  
Kartal G., Eryilmaz O. L., Krumdick G., Erdemir A., Timur S. İ.  
APPLIED SURFACE SCIENCE, vol.257, no.15, pp.6928-6934, 2011 (SCI-Expanded)
- XVIII. **Influence of process duration on structure and chemistry of borided low carbon steel**  
Kartal G., Timur S. İ., ERYILMAZ O. L., ERDEMİR A.  
SURFACE & COATINGS TECHNOLOGY, vol.205, no.5, pp.1578-1583, 2010 (SCI-Expanded)
- XIX. **Electrochemical bonding of titanium for improved mechanical properties**  
Kartal G., Timur Ş., Ürgen M. K., Erdemir A.  
SURFACE & COATINGS TECHNOLOGY, vol.204, no.23, pp.3935-3939, 2010 (SCI-Expanded)
- XX. **Investigating the morphology and corrosion behavior of electrochemically borided steel**  
Kartal G., KAHVECIOGLU O., Timur S. İ.  
SURFACE & COATINGS TECHNOLOGY, vol.200, no.11, pp.3590-3593, 2006 (SCI-Expanded)
- XXI. **Effects of process current density and temperature on electrochemical boriding of steel in molten salts**  
Kartal G., Timur S. İ., Arslan C.  
JOURNAL OF ELECTRONIC MATERIALS, vol.34, no.12, pp.1538-1542, 2005 (SCI-Expanded)

## Articles Published in Other Journals

- I. **Formation of Hard Metal Borides via Novel Molten Salt Electrolysis**  
KARTAL ŞİRELİ G., TİMUR S. İ.  
Erzmetall World of Metallurgy, vol.3, pp.162-170, 2017 (Peer-Reviewed Journal)
- II. **Investigation of nano metal and metal oxide particles synthesis by using medium frequency induction method**  
KARTAL L., KILIÇ Y., KARTAL ŞİRELİ G., TİMUR S. İ.  
SAÜ FEN BİL DER, vol.20, no.2, pp.371-381, 2016 (Peer-Reviewed Journal)
- III. **Orta frekans indüksiyon yöntemi ile nano metal ve nano metal oksit partikül sentezinin incelenmesi**  
KARTAL L., KILIÇ Y., KARTAL ŞİRELİ G., TİMUR S. İ.  
SAÜ Fen Bilimleri Enstitüsü Dergisi, vol.20, no.2, pp.371, 2016 (Peer-Reviewed Journal)
- IV. **Enhanced surface hardness by boron diffusion in martensitic stainless steel via Cathodic Reduction and Thermal Diffusion based Boriding CRTD Bor**  
KARTAL ŞİRELİ G., Yelkarası Ç., Özkalafat P., TİMUR S. İ., ÜRGEN M. K.  
Applied Mechanics and Materials, vol.719, pp.25-28, 2015 (Peer-Reviewed Journal)

- V. **Effects of electrochemical boriding process parameters on the formation of titanium borides**  
Kılıç A., Kartal G., ÜRGEN M. K., Timur S. İ.  
SURFACE ENGINEERING AND APPLIED ELECTROCHEMISTRY, vol.49, no.2, pp.168-175, 2013 (ESCI)
- VI. **Çeliklerin Borlanması ve Ergimiş Tuz Elektrolizi Yöntemiyle Borlama Koşullarının Belirlenmesi**  
KARTAL ŞİRELİ G., TİMUR S. İ.  
METAL MAKİNE DERGİSİ, vol.150, pp.452-458, 2004 (Non Peer-Reviewed Journal)
- VII. **Metallerin Çevresel Etkileri II**  
KARTAL ŞİRELİ G., Kahvecioğlu Ö., Güven A., TİMUR S. İ.  
TMMOB METALURJİ MÜHENDİSLERİ ODASI METALURJİ DERGİSİ, vol.137, pp.46-51, 2004 (Non Peer-Reviewed Journal)
- VIII. **Metallerin Çevresel Etkileri III**  
Güven A., Kahvecioğlu Ö., KARTAL ŞİRELİ G., TİMUR S. İ.  
TMMOB METALURJİ MÜHENDİSLERİ ODASI METALURJİ DERGİSİ, vol.138, pp.64-71, 2004 (Non Peer-Reviewed Journal)
- IX. **Metallerin Çevresel Etkileri I**  
Kahvecioğlu Ö., KARTAL ŞİRELİ G., Güven A., TİMUR S. İ.  
TMMOB METALURJİ MÜHENDİSLERİ ODASI METALURJİ DERGİSİ, vol.136, pp.47-53, 2003 (Non Peer-Reviewed Journal)

## Books & Book Chapters

- I. **ELECTROCHEMICAL BORIDING OF STEEL IN MOLTEN SALT BATHS.**  
Kartal Şireli G.  
in: ENCYCLOPEDIA OF IRON STEEL AND THEIR ALLOYS, Rafael Colás and George E. Totten, Editor, Taylor & Francis Compton's Encyclopedia, Newyork, pp.2284-2300, 2015
- II. **ELECTROCHEMICAL BORIDING OF STEEL IN MOLTEN SALT BATHS**  
KARTAL ŞİRELİ G.  
in: ENCYCLOPEDIA OF IRON STEEL AND THEIR ALLOYS, Rafael Colás and George Totten, Editor, Taylor & Francis Group, New York, pp.1-12, 2015

## Refereed Congress / Symposium Publications in Proceedings

- I. **New Green Technology for boron diffusion applications into different substrates**  
KARTAL ŞİRELİ G., TİMUR S. İ.  
34th Şişecam Glass Symposium, 21 - 22 November 2019, vol.1
- II. **AN ALTERNATIVE PROCESS DESIGN FOR PRODUCTION OF Mg(OH)<sub>2</sub> FROM WASTE DOLOMITE**  
TANISALI E., CENİKLİ C., ORMAN R., KILIÇ Y., KARTAL ŞİRELİ G., TİMUR S. İ.  
19th International Metallurgy and Materials Congress, İstanbul, Turkey, 25 - 27 October 2018
- III. **improving service performance of gear steel via CRTD-Bor**  
KARTAL ŞİRELİ G., OK A. C., TİMUR S. İ.  
19.Uluslararası Metalurji ve Malzeme Kongres, 25 - 27 October 2018
- IV. **Improving Service Performance Of Gear Steels Via Crtd-Bor**  
OK A. C., KARTAL ŞİRELİ G., TİMUR S. İ.  
International Materials Technologies and Metallurgy Conference 2017, 26 - 27 October 2017
- V. **MULTILAYERED COATINGS OF TiB<sub>2</sub> - Ti - TiC on CARBON STEELS via DUAL PROCESS: CAPVD and CRTD-Bor**  
YELKARASI Ç., KARTAL ŞİRELİ G., TİMUR S. İ., ÜRGEN M. K.  
International Workshop on Advanced Materials Challenges for Health and Alternative Energy Solutions (AMAES VI), Köln, Germany, 5 - 07 July 2017

- VI. **Investigation of Nano Silver Particles Synthesis by Medium Frequency Induction Method**  
KARTAL L., DARYAL B., KILIC Y., KARTAL ŞİRELİ G., TİMUR S. İ.  
18th International Metallurgy & Materials Congress, İstanbul, Turkey, 29 September - 01 October 2016, pp.283-286
- VII. **Synthesis of nanoparticles by using RF plasma system**  
DARYAL B., KARTAL L., KILIC Y., KARTAL ŞİRELİ G., TİMUR S. İ.  
18th International Metallurgy & Materials Congress, İstanbul, Turkey, 29 September - 01 October 2016, pp.279-282
- VIII. **Synthesis of submicron metal metal oxide particles production by medium frequency induction system**  
KARTAL L., DARYAL B., KILIC Y., KARTAL ŞİRELİ G., TİMUR S. İ.  
18th International Metallurgy & Materials Congre, İstanbul, Turkey, 29 September - 01 October 2016, pp.254-257
- IX. **Selective Sulphide Precipitation of Copper Nickel And Zinc From Industrial Wastewater**  
SEN A., KARTAL L., KARTAL ŞİRELİ G., TİMUR S. İ.  
18th International Metallurgy & Materials Congress, İstanbul, Turkey, 29 September - 01 October 2016, pp.363-366
- X. **Production of pure platinum and palladium from dore metals via hydrometallurgical methods**  
KILIC Y., KARTAL ŞİRELİ G., TİMUR S. İ.  
18th International Metallurgy & Materials Congress, İstanbul, Turkey, 29 September - 01 October 2016, pp.587-590
- XI. **MULTILAYERED COATINGS OF TiB /TiC ON MEDIUM CARBON STEELS VIA DUAL PROCESS: CAPVD AND CRTD-BOR**  
YELKARASI Ç., KARTAL ŞİRELİ G., TİMUR S. İ., ÜRGEN M. K.  
3rd International Conference on Metallurgical Coatings and Thin Films, San Diego, United States Of America, 25 - 29 April 2016
- XII. **Multilayered Coatings of TiB<sub>2</sub> TiC on medium carbon steels via dual process CAPVD and CRTD Bor**  
yelkarası ç., KARTAL ŞİRELİ G., TİMUR S. İ., ÜRGEN M. K.  
The 43rd International Conference on Metallurgical Coatings and Thin Films, 25 - 29 April 2016, pp.20
- XIII. **Synthesis of TiB<sub>2</sub> from Molten Salts On Different Substrates**  
özkalafat p., KARTAL ŞİRELİ G., TİMUR S. İ.  
17th International Metallurgy Materials Congress, İstanbul, Turkey, 11 - 13 September 2014
- XIV. **GROWTH OF TiB<sub>2</sub> ON AISI 1040 STEEL VIA COMBINED DUAL PROCESS: PVD AND CRTD-BOR**  
YELKARASI Ç., KARTAL ŞİRELİ G., TİMUR S. İ., ÜRGEN M. K.  
2ND INTERNATIONAL SURFACE TREATMENT SYMPOSIUM, İstanbul, Turkey, 25 - 27 June 2014
- XV. **Production of Hard Transition Metal Borides via Cathodic Reduction and Thermal Diffusion based boriding CRTD Bor**  
KARTAL ŞİRELİ G., TİMUR S. İ.  
The Collaborative Conference on Materials Research (CCMR) 2013, Jeju-Si, South Korea, 25 - 29 June 2013, pp.676-677
- XVI. **The Morphology and Corrosion Behaviours of Borided Low Carbon Steel and Titanium via CRTD Bor Method**  
KARTAL ŞİRELİ G., TİMUR S. İ.  
The European Corrosion Congress, İstanbul, Turkey, 9 - 13 September 2012, pp.624
- XVII. **Investigation of growth mechanism and kinetics of titanium borides formed on titanium substrates by electrochemical boriding**  
KARTAL ŞİRELİ G., TİMUR S. İ.  
3rd International Round Table on Titanium Production in Molten Salts, Cambridge, Canada, 17 - 19 June 2012
- XVIII. **Formation of TiB<sub>2</sub> coating on WC Co inserts via physical vapor deposition PVD and electrochemical boriding EB**  
KARTAL ŞİRELİ G., ÜRGEN M. K., TİMUR S. İ.  
International Symposium on Boron, Borides and Related Materials, İstanbul, Turkey, 11 - 17 September 2011,

pp.304

- XIX. **Comparison of Abrasive Wear Resistance of Low Carbon Steels Subjected to Carburizing Nitriding Nitrocarburizing and Boriding Treatment**  
sista v., KARTAL ŞİRELİ G., erdemir a., erylmaz l., Krumdick g., TİMUR S. İ.  
The 37th International Conference on Metallurgical Coatings and Thin Films, SAN DIEGO, United States Of America, 26 - 30 September 2010, pp.116
- XX. **Ultra fast and Thick Boriding as a Novel Surface Treatment for Demanding Tribological Applications**  
erdemir a., KARTAL ŞİRELİ G., erylmaz l., TİMUR S. İ.  
The 37th International Conference on Metallurgical Coatings and Thin Films, SAN DIEGO, United States Of America, 26 - 30 April 2010, pp.16
- XXI. **Innovative Surface Technologies for Advanced Automotive Applications From Super Hard and Low Friction Coatings to Super Fast Surface Treatments**  
erdemir a., KARTAL ŞİRELİ G., erylmaz l., KAZMANLI M. K., TİMUR S. İ., ÜRGEN M. K.  
The 36th International Conference on Metallurgical Coatings and Thin Films, SAN DIEGO, United States Of America, 27 April - 01 May 2009, pp.115
- XXII. **Effects of Additives on Electrochemically Borided Steel**  
KARTAL ŞİRELİ G., TİMUR S. İ.  
European Metallurgical Conference 2005, Dresden, Germany, 18 - 21 September 2005, pp.1820-1821

## Supported Projects

Kartal Şireli G., Akgül D., Project Supported by Higher Education Institutions, KRTDBor uygulamasında Alüminyum oksit Al<sub>2</sub>O<sub>3</sub> katkısının etkisi, 2022 - Continues

Kartal Şireli G., Karınzadehkhoei M., Project Supported by Higher Education Institutions, Farklı Malzemeler Üzerinde Çift İşlem (KA-FBB, KRTD-BOR) ile TiB<sub>2</sub> Kaplamasının Elde Edilmesi, 2019 - 2024

Kartal Şireli G., Project Supported by Higher Education Institutions, TiB<sub>2</sub> tabakasının farklı taban malzemeler üzerinde alternatif kombine proses (KAFBB KRTD-Bor) ile büyütülmesi, 2019 - 2023

Kartal Şireli G., Project Supported by Higher Education Institutions, Takım Çeliğinin KRTD-Bor Yöntemi ile Borlanması ve Süreçlerin Optimizasyonu, 2021 - 2022

Kartal Şireli G., Arslan M., Coşkun O. K., Karınzadehkhoei M., Project Supported by Higher Education Institutions, KRTD-BOR yönteminin darbeli akım metodu kullanılarak düşük karbonlu alaşımsız çeliklere uygulanması, 2020 - 2021

Kartal Şireli G., Technopark, Boriding of Titanium Alloys and Equipment Configuration, 2020 - 2021

Kartal Şireli G., Technopark, SPHERO DÖKME DEMİR VAKUM TUTUCULARINI KRTD-BOR YÖNTEMİ İLE BORLAMASI VE PROSES OPTİMİZASYONU, 2019 - 2020

Kartal Şireli G., Project Supported by Other Private Institutions, Boriding Equipment Process Configuration, 2019 - 2020

Kartal Şireli G., BOREN, Ulusal Bor Araştırma Enstitüsü Projesi, Milli Ergimiş Tuz - Bor Difüzyon Teknolojisiyle Otomotiv Sektöründe Yeni Nesil Yüksek Performanslı Çelik Ürünlerin Üretilmesi, 2016 - 2020

Kartal Şireli G., Project Supported by Higher Education Institutions, Vites Dişlisinin Katodik Redüksiyon Termal Difüzyon Yöntemiyle Borlanması, 2016 - 2018

Kartal Şireli G., Project Supported by Higher Education Institutions, Enhanced surface hardness by boron diffusion in martensitic stainless steel via Cathodic Reduction and Thermal Diffusion based Boriding (CRTD-Bor), 2014 - 2018

Kartal Şireli G., Project Supported by Higher Education Institutions, Production of Hard Transition Metal Borides via Cathodic Reduction and Diffusion based boriding (v CRTD Bor ), 2013 - 2018

Kartal Şireli G., Project Supported by Higher Education Institutions, Growth Kinetics of Electrochemical Boriding of Titanium, 2012 - 2018

## Patent

Timur S. İ., Kartal Şireli G., Ultra-Fast Boriding of Metal Surfaces for Improved Properties, Patent, CHAPTER C Chemistry;

Metallurgy, Standard Registration

Kartal Şireli G., TİTANYUM DİBORÜR KAPLI İMPLANT, Patent, CHAPTER C Chemistry; Metallurgy, The Invention

Registration Number: 2017 12592 , Standard Registration, 2020

## **Metrics**

Publication: 57

Citation (WoS): 483

Citation (Scopus): 482

H-Index (WoS): 9

H-Index (Scopus): 10

## **Non Academic Experience**

Argonne National Laboratory- ANL