

# Prof. ESAT GÜMÜŞKAYA

## Personal Information

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**Post Address:** KARADENİZ TEKNİK ÜNİVERSİTESİ, ORMAN FAKÜLTESİ, ORMAN ENDÜSTRİ MÜHENDİSLİĞİ BÖLÜMÜ, 61080, TRABZON

## Education Information

Doctorate, Karadeniz Technical University, Fen Bilimleri Enstitüsü, Lif Ve Kağıt Teknolojisi, Turkey 1997 - 2002

Post Graduate, Karadeniz Technical University, Fen Bilimleri Enstitüsü, Orman Endüstri Mühendisliği, Turkey 1994 - 1997

Under Graduate, Karadeniz Technical University, Orman Fakültesi, Orman Endüstri Mühendisliği, Turkey 1990 - 1994

## Foreign Languages

English, B2 Upper Intermediate

## Dissertations

Doctorate, KENDİR (*Cannabis sativa* L.) SOYMUĞ LİFLERİNDEN ASİDİK VE ALKALİ ORTAMLARDA ÜRETİLEN KAĞIT HAMURLARININ KİMYASAL VE KRİSTAL YAPI ÖZELLİKLERİ, Karadeniz Technical University, Fen Bilimleri Enstitüsü, Lif Ve Kağıt Teknolojisi, 2002

Post Graduate, BUĞDAY SAPLARINDAN (*Triticum aestivum* L.) NaOH-O<sub>2</sub> YÖNTEMİYLE ELDE EDİLEN KAĞIT HAMURLARININ KRİSTALLİŞK DERECEİNİN BELİRLENMESİ, Karadeniz Technical University, Fen Bilimleri Enstitüsü, Orman Endüstri Mühendisliği, 1997

## Research Areas

Agricultural Sciences, Forestry, Forest Industry Engineering, Forest Products Chemistry and Technology, Forest Products Chemistry, Pulp (pulp), Paper and cardboard production technology, Paper surface coating, Paper packaging technology, Paper recycling, Wood chemistry

## Academic Titles / Tasks

Professor, Karadeniz Technical University, Orman Fakültesi, Orman Endüstri Mühendisliği, 2011 - Continues

Associate Professor, Karadeniz Technical University, Orman Fakültesi, Orman Endüstri Mühendisliği, 2006 - 2011

Assistant Professor, Karadeniz Technical University, Orman Fakültesi, Orman Endüstri Mühendisliği, 2004 - 2006

Research Assistant, Karadeniz Technical University, Orman Fakültesi, Orman Endüstri Mühendisliği, 1997 - 2002

## Courses

LİFLEVHA ENDÜSTRİSİ, Under Graduate, 2015 - 2016

SELÜLOZ TÜREVLERİ ENDÜSTRİSİ, Post Graduate, 2014 - 2015

SELÜLOZUN HİDROLİZİ VE DEGRADASYONU, Post Graduate, 2015 - 2016

KAĞIT FABRİKASYONU, Under Graduate, 2014 - 2015  
ÖZEL KAĞITLAR TEKNOLOJİSİ, Under Graduate, 2014 - 2015  
SELÜLOZUN KİMYASAL MODİFİKASYON YÖNTEMLERİ, Post Graduate, 2015 - 2016  
KAĞIT KİMYASI, Post Graduate, 2014 - 2015  
SELÜLOZUN KARAKTERİZASYONU, Post Graduate, 2014 - 2015  
KAĞIT ENDÜSTRİSİNDE ÇEVRE KİRLENMESİ, Under Graduate, 2014 - 2015  
KAĞIT HAMURU AĞARTMA TEKNOLOJİSİ, Post Graduate, 2013 - 2014  
OLUKLU MUKAVVA ÜRETİMİ, Post Graduate, 2013 - 2014  
KAĞIT MAKİNALARI, Post Graduate, 2013 - 2014  
KAĞIT FİZİĞİ, Post Graduate, 2013 - 2014  
LİGNİN KİMYASI, Post Graduate, 2012 - 2013  
PİŞİRMENİN KİMYASI, Post Graduate, 2012 - 2013

## Advising Theses

GÜMÜŞKAYA E., SELÜLOZİK SÜPERABSORBENT ÜRETİMİNDE MEKANİK VE KİMYASAL ÖN İŞLEMLERİNİN ETKİLERİ, Post Graduate, A.Damla(Student), 2019  
GÜMÜŞKAYA E., ALTI FARKLI YÖNTEMLE SELÜLOZ ASETAT ÜRETİMİ, Doctorate, E.ERİŞİR(Student), 2016  
GÜMÜŞKAYA E., ATIK OLUKLU MUKAVVADAN ELDE EDİLEN KAĞIT HAMURUNDAN OKSİJENLE LİGNİN UZAKLAŞTIRILMASI VE MODİFİKASYONU, Post Graduate, B.OKTAY(Student), 2012  
GÜMÜŞKAYA E., ALKALİ SÜLFİT YÖNTEMİNİN DELİGNİFİKASYON ORANI VE VERİMİNİN ARTIRILMASI, Post Graduate, E.ERİŞİR(Student), 2010

## Jury Memberships

Associate Professor Exam, ESAT GÜMÜŞKAYA, ÜAK, October, 2015  
Associate Professor Exam, ESAT GÜMÜŞKAYA, ÜAK, May, 2014  
Associate Professor Exam, ESAT GÜMÜŞKAYA, ÜAK, October, 2013

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

- **COMPARISON OF REINFORCED OXYGEN DELIGNIFICATION METHODS FOR OLD CORRUGATED BOARD (OCC) FIBRES**  
KOÇ B. O. , GÜMÜŞKAYA E., Erişir E., Pesman E., KIRCI H.  
DREWNO, vol.60, pp.47-64, 2017 (Journal Indexed in SCI)
- **Alkaline sulphite pulping of Caucasian spruce (*Picea orientalis* L.) chips with additions of NaBH<sub>4</sub> and Ethanol**  
ERİŞİR E., GÜMÜŞKAYA E., KIRCI H., MISIR N.  
DREWNO, vol.58, no.194, pp.89-102, 2015 (Journal Indexed in SCI Expanded)
- **Alkaline sulphite pulping of Caucasian spruce (*Picea orientalis* L.) chips with additions of NaBH<sub>4</sub> and Ethanol**  
ERİŞİR E., GÜMÜŞKAYA E., KIRCI H., MISIR N.  
DREWNO, vol.58, no.194, pp.89-102, 2015 (Journal Indexed in SCI Expanded)
- **Alkaline sulphite anthraquinone pulping of caucasian spruce (*Picea orientalis* L.) chips with added sodium borohydride and ethanol**  
KIRCI H., Erişir E., Gümüşkaya E., Misir N.  
DREWNO, vol.58, no.194, pp.89-102, 2015 (Journal Indexed in SCI Expanded)
- **ALKALINE SULPHITE ANTHRAQUINONE PULPING OF CAUCASIAN SPRUCE (*PICEA ORIENTALIS* L.) CHIPS WITH ADDED SODIUM BOROHYDRIDE AND ETHANOL**  
Erisir E., GÜMÜŞKAYA E., KIRCI H., MISIR N.  
DREWNO, vol.58, pp.89-102, 2015 (Journal Indexed in SCI)

- **An FT-IR study of the changes in chemical composition of bamboo degraded by brown-rot fungi**  
Tomak E. D. , Topaloglu E., GÜMÜŞKAYA E., YILDIZ Ü. C. , AYN.  
INTERNATIONAL BIODETERIORATION & BIODEGRADATION, vol.85, pp.131-138, 2013 (Journal Indexed in SCI)
- **The efficiency of tannin as a formaldehyde scavenger chemical in medium density fiberboard**  
Boran S., USTA M., ONDARAL S., GÜMÜŞKAYA E.  
COMPOSITES PART B-ENGINEERING, vol.43, pp.2487-2491, 2012 (Journal Indexed in SCI)
- **Decreasing formaldehyde emission from medium density fiberboard panels produced by adding different amine compounds to urea formaldehyde resin**  
Boran S., USTA M., GÜMÜŞKAYA E.  
INTERNATIONAL JOURNAL OF ADHESION AND ADHESIVES, vol.31, pp.674-678, 2011 (Journal Indexed in SCI)
- **Influence of plum gum and sodium perborate addition on spruce kraft pulp properties during oxygen delignification**  
GÜMÜŞKAYA E., Pesman E., KIRCI H., Ucar M. B.  
WOOD SCIENCE AND TECHNOLOGY, vol.45, pp.573-582, 2011 (Journal Indexed in SCI)
- **The Effect of Sodium Borohydride on Alkaline Sulfite-Anthraquinone Pulping of Pine (*Pinus pinea*) Wood**  
GÜMÜŞKAYA E., Erisir E., KIRCI H., MISIR N.  
INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH, vol.50, pp.8340-8343, 2011 (Journal Indexed in SCI)
- **Technological and chemical properties of chestnut (*Castanea sativa* Mill.) wood after heat treatment**  
Ates S., Akyildiz M. H. , Ozdemir H., GÜMÜŞKAYA E.  
ROMANIAN BIOTECHNOLOGICAL LETTERS, vol.15, pp.4949-4958, 2010 (Journal Indexed in SCI)
- **EFFECT OF DRYING AND CHEMICAL TREATMENT ON BAGASSE SODA PULP PROPERTIES DURING RECYCLING**  
Sheikhi P., Talaeipour M., Hemasi A. H. , Eslam H. K. , GÜMÜŞKAYA E.  
BIORESOURCES, vol.5, pp.1702-1716, 2010 (Journal Indexed in SCI)
- **Effect of anthraquinone on brightness value and crystalline structure of pulp during soda processes**  
GÜMÜŞKAYA E., Kalyoncu E. E. , Kirci H.  
CHEMICAL PAPERS, vol.63, pp.670-676, 2009 (Journal Indexed in SCI)
- **Effect of ethyl acetate on carbohydrate components and crystalline structure of pulp produced in aqueous acetic acid pulping**  
GÜMÜŞKAYA E., USTA M., Ucar M. B.  
CHEMICAL PAPERS, vol.63, pp.284-290, 2009 (Journal Indexed in SCI)
- **Comparison of Different Chemical Pulp from Wheat Straw and Bleaching with Xylanase Pre-Treated ECF Method**  
Ates S., Atik C., Ni Y., GÜMÜŞKAYA E.  
TURKISH JOURNAL OF AGRICULTURE AND FORESTRY, vol.32, pp.561-570, 2008 (Journal Indexed in SCI)
- **Comparative Properties of Pulp and Paper Obtained From Kraft-ethanol and Kraft-Ethylene Glycol Properties**  
USTA M., BORAN S., GÜMÜŞKAYA E., ONDARAL S., BALABAN M.  
CELLULOSE CHEMISTRY AND TECHNOLOGY, vol.41, pp.313-320, 2007 (Journal Indexed in SCI)
- **Comparative properties of the pulp and paper obtained from kraft-ethanol and kraft-ethylene glycol processes**  
USTA M., Boran S., GÜMÜŞKAYA E., ONDARAL S., Balaban M.  
CELLULOSE CHEMISTRY AND TECHNOLOGY, vol.41, pp.311-318, 2007 (Journal Indexed in SCI)
- **Crystalline structure of heat-treated Scots pine [*Pinus sylvestris* L.] and Uludag fir [*Abies nordmanniana* (Stev.) subsp *bornmuelleriana* (Mattf.)] wood**  
Akgul M., Gumuskaya E., Korkut S.  
WOOD SCIENCE AND TECHNOLOGY, vol.41, pp.281-289, 2007 (Journal Indexed in SCI)
- **Carbohydrate components and crystalline structure of organosolv hemp (*Cannabis sativa* L.) bast fibers pulp**  
Gumuskaya E., Usta M., Balaban M.  
BIORESOURCES TECHNOLOGY, vol.98, pp.491-497, 2007 (Journal Indexed in SCI)
- **The effects of thermal modification on crystalline structure of cellulose in soft and hardwood**

Yıldız S., Gumuskaya E.

BUILDING AND ENVIRONMENT, vol.42, pp.62-67, 2007 (Journal Indexed in SCI)

- **Dependence of chemical and crystalline structure of alkali sulfite pulp on cooking temperature and time**  
Gumuskaya E., usta M. U.  
CARBOHYDRATE POLYMERS, vol.65, pp.461-468, 2006 (Journal Indexed in SCI)
- **The Effects of Oxygen and Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) on the Crystalline Structure of Cellulose During Soda Pulping**  
GÜMÜŞKAYA E., USTA M., ODABAŞ SERİN Z., ONDARAL S., USTAÖMER D.  
CELLULOSE CHEMISTRY AND TECHNOLOGY, vol.40, pp.259-264, 2006 (Journal Indexed in SCI)
- **The effects of oxygen and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) on the crystalline structure of cellulose during soda pulping**  
Guemueskaya E., usta M. U. , Serin Z. O. , Ondaral S., Ustaoemer D.  
CELLULOSE CHEMISTRY AND TECHNOLOGY, vol.40, pp.259-264, 2006 (Journal Indexed in SCI)
- **The effects of various pulping conditions on crystalline structure of cellulose in cotton linters**  
Gumuskaya E., Usta M., Kirci H.  
POLYMER DEGRADATION AND STABILITY, vol.81, pp.559-564, 2003 (Journal Indexed in SCI)
- **A new environmentally friendly pulping and bleaching technology for poplar wood**  
Kirci H., Usta M., Gumuskaya E.  
CELLULOSE CHEMISTRY AND TECHNOLOGY, vol.37, pp.273-282, 2003 (Journal Indexed in SCI)
- **Characterisation of the crystalline structure in cotton linters cellulose**  
Usta M., Gumuskaya E., Serin Z.  
CELLULOSE CHEMISTRY AND TECHNOLOGY, vol.37, pp.7-18, 2003 (Journal Indexed in SCI)

## Articles Published in Other Journals

- **THE EFFECTS OF H<sub>2</sub>SO<sub>4</sub> CATALYST RATIOS IN PRODUCTION PROCESS ON CELLULOSE ACETATE PROPERTIES**  
Erisir E., GÜMÜŞKAYA E.  
SIGMA JOURNAL OF ENGINEERING AND NATURAL SCIENCES-SIGMA MUHENDISLIK VE FEN BILIMLERI DERGISI, vol.10, pp.19-28, 2019 (Journal Indexed in ESCI)
- **Avrupa Ülkeleri ile Türkiye'nin Kuş Kâğıt Üretim ve Dış Ticaret Miktarları Üzerine Bir Araştırma**  
AKYÜZ İ., GÜMÜŞKAYA E., GEDİK T.  
DÜZCE ÜNİVERSİTESİ ORMAN FAKÜLTESİ ORMANCILIK DERGİSİ, vol.9, pp.1-13, 2013 (National Refreed University Journal)
- **EFFECTS OF CHEMICAL COMPOSITION OF WOOD AND RESIN TYPE ON PROPERTIES OF PARTICLEBOARD**  
SARI B., NEMLİ G., Ayrılmış n., Baharoğlu M., bardak s., GÜMÜŞKAYA E.  
Lignocellulose, vol.1, pp.174-184, 2012 (Refereed Journals of Other Institutions)
- **Effects of Chemical Composition of Wood and Resin Type on Properties of Particleboard**  
Sarı B., Nemli G., Ayrılmış N., Baharoglu M., GÜMÜŞKAYA E., Bardak S.  
Lignocellulose J., vol.1, pp.174-184, 2012 (International Refereed University Journal)
- **The Effects of Acetic Acid/Water Pulping Process on Chemical and Crystalline Structure of Cellulose in Hemp (Cannabis sativa L.) Bast Fiber**  
GÜMÜŞKAYA E., USTA M.  
Balkan Pulp and Paper News, no.6, pp.25-28, 2005 (Refereed Journals of Other Institutions)
- **Kendir Odunsu Öz Kısımından Elde Edilen Karbonhidrat Bileşenlerinin Kristal Yapı Özelliklerinin FT-IR Spektroskopisi Yöntemiyle Belirlenmesi**  
GÜMÜŞKAYA E.  
Kafkas Üniversitesi Artvin Orman Fakültesi Dergisi, vol.6, pp.86-93, 2005 (National Refreed University Journal)
- **Selülozun Kristal Yapısı**  
GÜMÜŞKAYA E.  
Kafkas Üniversitesi Artvin Orman Fakültesi Dergisi, vol.6, pp.69-78, 2005 (National Refreed University Journal)
- **Buğday (Triticum aestivum L.) Sapı Soda-Oksijen Kağıt Hamurunun Kimyasal ve Kristal Yapısı ile Optik**

### Özellikleri Arasındaki İlişkiler

GÜMÜŞKAYA E., Serin Z., Ondaral S., Ustaömer D.

Kafkas Üniversitesi Artvin Orman Fakültesi Dergisi, vol.4, pp.14-21, 2003 (National Refreed University Journal)

- **Buğday (*Triticum aestivum* L.) Sapı Soda-Oksijen Kağıt Hamurunun Kimyasal ve Kristal Yapısı ile optik Özellikleri Arasındaki İlişkiler**

GÜMÜŞKAYA E., Serin Z., ONDARAL S., USTAÖMER D.

Kafkas Üniversitesi - Artvin Orman Fakültesi Dergisi, vol.1, pp.14-20, 2003 (National Refreed University Journal)

- **Crystalline Structure Properties of Bleached and Unbleached Wheat Straw (*Triticum aestivum* L.) Soda-Oxygen Pulp**

GÜMÜŞKAYA E., USTA M.

TURKISH JOURNAL OF AGRICULTURE AND FORESTRY, vol.26, pp.247-252, 2001 (Other Refereed National Journals)

## Refereed Congress / Symposium Publications in Proceedings

- **The Effects of Ethanol or Ethylene Glycol Added Conventional Sulphate Pulping on Pulp Properties**  
USTA M., GÜMÜŞKAYA E., BORAN S.  
10th Meeting of Pulp and Paper Industry of Balkan (Southeast European) Countries, Greece, pp.1
- **The Oxidative Pretreatments of Cellulose for Cellulosic Superabsorbents**  
ÇELİK A. D. , GÜMÜŞKAYA E., KIRCI H., ERİŞİR E.  
THE INTERNATIONAL FOREST PRODUCTS CONGRESS- ORENKO 2018, Trabzon, Turkey, 26 - 29 September 2018, pp.943-950
- **The oxidative pretreatments of cellulose superabsorbents**  
ÇELİK A. D. , GÜMÜŞKAYA E., KIRCI H., ERİŞİR E.  
INTERNATIOPNAL FOREST PRODUCTS CONGRESS, Trabzon, Turkey, 26 - 29 September 2018, pp.142
- **The Effects of H2SO4 Catalyst Amounts in Production Process on Cellulose Acetate Properties**  
ERİŞİR E., GÜMÜŞKAYA E.  
THE INTERNATIONAL FOREST PRODUCTS CONGRESS-ORENKO 2018, Trabzon, Turkey, 26 - 29 September 2018, pp.933-942
- **Türkiye kağıt sanayiinin mevcut durumu, sorunları ve çözüm önerileri**  
USTA M., KIRCI H., DENİZ İ., GÜMÜŞKAYA E.  
I.Çevre ve Ormanlık Şurası, Antalya, Turkey, 22 - 24 March 2005, vol.3, pp.1162-1169
- **Türkiye Kağıt Sanayiinin Mevcut Durumu, Sorunları ve Çözüm Önerileri**  
USTA M., KIRCI H., DENİZ İ., GÜMÜŞKAYA E.  
I. Çevre ve Ormanlık Şurası, Antalya, Turkey, 1 - 03 March 2005, vol.3, pp.1162-1169
- **The Effects of Acetosolv process on Chemical and Crystalline Structure of Cellulose in Hemp (*Cannabis satşiva* L.) Bast Fibers**  
GÜMÜŞKAYA E., USTA M.  
11th Meeting of Pulp and Paper Industry of Balkan (Southeast European) Countries, Opatija, Croatia, 6 - 08 October 2004, pp.4-8
- **The Effects of Ethanol or Ethylene Glycol Added Conventional Sulphate Pulping on Pulp Properties**  
USTA M., GÜMÜŞKAYA E., BORAN S.  
10th Meeting of Pulp and Paper Industry of Balkan (Southeast European) Countries, Agia Triada, Thessaloniki, Greece, 29 - 31 October 2003, pp.25-31
- **The Effects of White-Water System Closure on Efficiency of Retention Systems**  
ONDARAL S., SERİN Z., GÜMÜŞKAYA E.  
XXXI. International Forestry Students Symposium, İstanbul, Turkey, 1 - 15 October 2003, pp.327-335
- **The Determination of Microfibril Angle in Wood**  
BORAN S., SERİN Z., GÜMÜŞKAYA E.  
XXXI. International Forestry Students Symposium, İstanbul, Turkey, 1 - 15 October 2003, pp.295-303
- **A review of The Chemical Composition of Different Softwoods, Hardwoods and Agricultural Residues**  
SERİN Z., GÜMÜŞKAYA E., ONDARAL S.

XXXI. International Forestry Students Symposium, İstanbul, Turkey, 1 - 15 October 2003, pp.348-359

- **The Fine Structure of Cellulose in Hemp (*Cannabis sativa L.*) Bast Fibers During Organosolv Pulping**  
USTA M., GÜMÜŞKAYA E., SERİN Z., ONDARAL S.  
13th International Symposium on Cellulose Chemistry and Technology, Iasi, Romania, 3 - 05 September 2003, pp.124-130
- **The Fine Structure of Cellulose in Hemp (*Cannabis sativa L.*) Bast Fibers During Organosolv Pulping**  
USTA M., GÜMÜŞKAYA E., SERİN Z., ONDARAL S.  
13th International Symposium on Cellulose Chemistry and Technology, Iasi, Romania, 3 - 05 September 2003, pp.5-10
- **The determination of Micro fibril Angle in wood**  
BORAN S., USTAÖMER D., GÜMÜŞKAYA E.  
XXXI International Forestry Students Symposium, İstanbul, Turkey, 1 - 15 September 2003, pp.295-303
- **The Effects of White-Water System Closure on The Efficiency of Retention Systems**  
ONDARAL S., SERİN Z., GÜMÜŞKAYA E.  
International Forestry Students Symposium, İstanbul, Turkey, 1 - 15 September 2003, pp.20-25
- **Soda-oxygen and soda pulping of phragmites (*Phragmites communis L.*) reed**  
KIRCI H., USTA M., GÜMÜŞKAYA E.  
The 9th Meeting of Pulp and Paper Industry of Balkan Countries, Budapeşte, Hungary, 11 - 14 October 2002, vol.9, pp.102-108
- **Soda-Oxygen and Soda-Air Pulping of Common Reed (*Phragmites communis L.*) Reed**  
KIRCI H., USTA M., GÜMÜŞKAYA E.  
The 9th Meeting of The Pulp and Paper Industry (Southeast European) Countries, Sremska Mitrovica, Serbia And Montenegro, 9 - 11 October 2002, pp.25-30
- **Chemical and Crystalline Structure Properties of Hemp (*Cannabis sativa L.*) Bast Fibres Pulp Obtained Various Processes**  
USTA M., GÜMÜŞKAYA E., SERİN Z.  
The 8th Meeting of Pulp and Paper Industry of Balkan Countries, Sofya, Bulgaria, 3 - 05 October 2001, pp.5-10
- **The Effects of Acetylation on Some Properties of Medium Density Fiberboards**  
USTA M., SERİN Z., GÜMÜŞKAYA E., KÜÇÜKÖMEROĞLU T.  
The Fourth European Panel Products Symposium, Llandudno, Wales, United Kingdom, 11 - 13 November 2000, pp.193-200
- **Changes of Crystallinity of Cellulose in Cotton Linters Pulp Bleached with CEH Sequences**  
USTA M., GÜMÜŞKAYA E.  
The 7th Meeting of Pulp and Paper Industry of Balkan Countries, Novi Sad, Serbia And Montenegro, 8 - 10 November 2000, pp.20-25
- **Soda-Oxygen Pulping of Hemp (*Cannabis sativa L.*) Fibers**  
USTA M., EROĞLU H., GÜMÜŞKAYA E.  
Twelfth International Symposium on Cellulose Chemistry and Technology, Iasi, Romania, 21 - 23 September 1999, pp.14-18
- **The Determination of Crystallinity in Wheat Straw Soda-Oxygen Pulp by X-ray Diffraction Method**  
USTA M., GÜMÜŞKAYA E.  
The 5th Meeting of Pulp and Paper Industry of Balkan Countries, Constanta, Romania, 7 - 09 October 1998, pp.6-11

## Other Publications

- **POTASSIUM CARBONATE CATALYSED TRANSESTERIFICATION OF CELLULOSE IN DMSO/TBAF**  
ERİŞİR E., GÜMÜŞKAYA E., ÇELİK A. D.  
Presentation, pp.11, 2015

## Supported Projects

GÜMÜŞKAYA E., Industrial Thesis Project, Tekstil İplikhane ve Dokuma Telefleri Kullanılarak Sanatsal Kağıt Üretilirliğinin Araştırılması, 2020 - Continues

GEZER E. D. , YILDIZ Ü. C. , TEMİZ A., GÜMÜŞKAYA E., TUBITAK Project, Farklı beyaz çürüklük mantarları ile inkübe edilmiş lignoselülozik materyallerden biyobozunur malzemelerin üretilmesi ve teknolojik özelliklerinin belirlenmesi, Continues

KIRCI H., GÜMÜŞKAYA E., TUBITAK Project, Oluklu mukawa üretiminde kullanılan nişasta bazlı tutkalın özelliklerinin geliştirilmesi ve üretimde etkin kullanımı, Continues

ALVER Ü., GÜMÜŞKAYA E., ÇUVALCI H., ASLAN M., GÜLER O., YAZGAN A., DURAN C., KÜÇÜKÖMEROĞLU T., ALTUNIŞIK A. C. , OKUMUŞ H. İ. , et al., Project Supported by Higher Education Institutions, Polimer Matrisli Nano Parçacık Takviyeli Kompozit Malzemelerin Üretilmesi ve Optik ve Termal Özelliklerinin İncelenmesi, 2018 - 2020

USTAÖMER D., BEYAZLI Ş., NEMLİ İ., GÜMÜŞKAYA E., Project Supported by Higher Education Institutions, Nanokil ve Diğer Bazı Kimyasal Maddeler ile Üretilen Liflevhaların yanma ve diğer özelliklerindeki değişimler, 2017 - 2019

USTAÖMER D., GÜMÜŞKAYA E., TUBITAK Project, Mekanik ve Oksidatif Kimyasal Ön İşlemlerin Selülozik Süperabsorbent (Hydrogel) Özellikleri Üzerine Etkileri, 2016 - 2018

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