

## Assoc. Prof. MAKBULE TERLEMEZOĞLU BİLMİŞ

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### Education Information

Doctorate, Middle East Technical University, Faculty Of Arts And Sciences, Department Of Physics, Turkey 2013 - 2019

Postgraduate, Middle East Technical University, Faculty Of Arts And Sciences, Department Of Physics, Turkey 2009 - 2013

### Dissertations

Doctorate, CZTSSe thin film: growth, characterization and solar cell applications, Middle East Technical University, Faculty Of Arts And Sciences, Department Of Physics, 2019

Postgraduate, Comparison of crystal Si solar cells fabricated on P-type and N-type float zone silicon wafers, Middle East Technical University, Faculty Of Arts And Sciences, Department Of Physics, 2013

### Research Areas

Materials Science, Surfaces, Interfaces, Thin Films and Nanosystems, Electrical properties of electronic structures, interfaces, thin films and low-dimensional structures

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

- I. **Flow rate-dependent properties of SnO<sub>2</sub> thin films deposited by ultrasonic spray pyrolysis**  
GÜNEŞ İ., Sarica E., Ozcan H. B., TERLEMEZOĞLU BİLMİŞ M., AKYÜZ İ.  
Optical Materials, vol.150, 2024 (SCI-Expanded)
- II. **Structural, morphological, and temperature-tuned bandgap properties of single-step thermally evaporated Sb<sub>2</sub>Se<sub>3</sub> thin films**  
TERLEMEZOĞLU BİLMİŞ M.  
Applied Physics A: Materials Science and Processing, vol.130, no.4, 2024 (SCI-Expanded)
- III. **Fine-tuning SnO<sub>2</sub> films: Unleashing their potential through deposition temperature optimization by ultrasonic spray pyrolysis**  
Sarica E., Ozcan H. B., GÜNEŞ İ., TERLEMEZOĞLU BİLMİŞ M., AKYÜZ İ.  
Ceramics International, vol.50, no.6, pp.9270-9279, 2024 (SCI-Expanded)
- IV. **Nanowire geometry effects on devices and transport mechanisms: SnS<sub>2</sub>/SiNW heterojunction**  
COŞKUN E., Emir C., TERLEMEZOĞLU BİLMİŞ M., PARLAK M.  
Journal of Materials Science, vol.58, no.38, pp.15132-15143, 2023 (SCI-Expanded)

- V. **Physical characterization of thermally evaporated Sn–Sb–Se thin films for solar cell applications**  
Bektas T., Surucu O., TERLEMEZOĞLU BİLMİŞ M., PARLAK M.  
Applied Physics A: Materials Science and Processing, vol.129, no.5, 2023 (SCI-Expanded)
- VI. **Optical light management by self-arrangement of inverted tetragonal pyramids on the silicon surface through copper-assisted etching technique in a single step**  
Dönerçark E., ÇOLAKOĞLU T., Terlemezoglu M., Abak M. K., ÇİFTPINAR E. H., BEK A., TURAN R.  
International Journal of Energy Research, vol.46, no.15, pp.24322-24331, 2022 (SCI-Expanded)
- VII. **Temperature effects on optical characteristics of thermally evaporated CuSbSe<sub>2</sub> thin films for solar cell applications**  
Surucu O., Isik M., Terlemezoglu M., Bektas T., HASANLI N., PARLAK M.  
Optical Materials, vol.133, 2022 (SCI-Expanded)
- VIII. **Structural, morphological and temperature-tuned bandgap characteristics of CuS nano-flake thin films**  
Isik M., Terlemezoglu M., HASANLI N., PARLAK M.  
Physica E: Low-Dimensional Systems and Nanostructures, vol.144, 2022 (SCI-Expanded)
- IX. **Growth and optical characterization of Sn<sub>0.6</sub>Sb<sub>0.4</sub>Se layer single crystals for optoelectronic applications**  
Bektas T., Terlemezoglu M., Surucu O., Isik M., PARLAK M.  
Materials Science in Semiconductor Processing, vol.141, 2022 (SCI-Expanded)
- X. **Growth and Characterization of Stoichiometric Cu<sub>2</sub>ZnSnS<sub>4</sub> Crystal Using Vertical Bridgman Technique**  
Peksu E., Terlemezoglu M., PARLAK M., Karaağaç H.  
Physica Status Solidi (A) Applications and Materials Science, vol.219, no.3, 2022 (SCI-Expanded)
- XI. **Temperature-dependent optical characteristics of sputtered NiO thin films**  
Terlemezoglu M., Surucu O., Isik M., HASANLI N., PARLAK M.  
Applied Physics A: Materials Science and Processing, vol.128, no.1, 2022 (SCI-Expanded)
- XII. **Characterization of Cu-rich and Zn-poor Cu<sub>2</sub>ZnSnS<sub>4</sub> single crystal grown by vertical Bridgman technique**  
Peksu E., Terlemezoglu M., PARLAK M., Karaağaç H.  
Journal of Crystal Growth, vol.574, 2021 (SCI-Expanded)
- XIII. **Fabrication of CdSexTe<sub>1-x</sub> thin films by sequential growth using double sources**  
Demir M., Gullu H., Terlemezoglu M., PARLAK M.  
Physica B: Condensed Matter, vol.619, 2021 (SCI-Expanded)
- XIV. **The effect of Zn concentration on the structural and optical properties of Cd<sub>1-x</sub>ZnxS nanostructured thin films**  
Isik M., Terlemezoglu M., Isik S., Erturk K., HASANLI N.  
Journal of Materials Science: Materials in Electronics, vol.32, no.20, pp.25225-25233, 2021 (SCI-Expanded)
- XV. **Illumination and voltage effects on the forward and reverse bias current-voltage (I-V) characteristics in In/In<sub>2</sub>S<sub>3</sub>/p-Si photodiodes**  
Yukselturk E., Surucu O., Terlemezoglu M., Parlak M., Altındal Ş.  
JOURNAL OF MATERIALS SCIENCE-MATERIALS IN ELECTRONICS, vol.32, no.17, pp.21825-21836, 2021 (SCI-Expanded)
- XVI. **Structural and temperature-tuned bandgap characteristics of thermally evaporated β-In<sub>2</sub>S<sub>3</sub> thin films**  
Surucu O., Isik M., Terlemezoglu M., HASANLI N., PARLAK M.  
Journal of Materials Science: Materials in Electronics, vol.32, no.12, pp.15851-15856, 2021 (SCI-Expanded)
- XVII. **Optical and structural characteristics of electrodeposited Cd<sub>1-x</sub>ZnxS nanostructured thin films**  
Erturk K., Isik M., Terlemezoglu M., HASANLI N.  
Optical Materials, vol.114, 2021 (SCI-Expanded)
- XVIII. **Temperature-tuned band gap properties of MoS<sub>2</sub> thin films**  
Surucu O., Isik M., HASANLI N., Terlemezoglu M., PARLAK M.

Materials Letters, vol.275, 2020 (SCI-Expanded)

- XXIX. **Vibrational modes in (TlGaS<sub>2</sub>)<sub>x</sub>-(TlGaSe<sub>2</sub>)<sub>1-x</sub> mixed crystals by Raman measurements: compositional dependence of the mode frequencies and line-shapes**  
Isik M., Terlemezoglu M., HASANLI N., Babayeva R.  
Journal of Materials Science: Materials in Electronics, vol.31, no.17, pp.14330-14335, 2020 (SCI-Expanded)
- XX. **Investigation of band gap energy versus temperature for SnS<sub>2</sub> thin films grown by RF-magnetron sputtering**  
Isik M., Gullu H., Terlemezoglu M., Surucu O. B., PARLAK M., HASANLI N.  
Physica B: Condensed Matter, vol.591, 2020 (SCI-Expanded)
- XXI. **Electrical characterization of CdZnTe/Si diode structure**  
Balbasi C. D., Terlemezoglu M., Gullu H., Yildiz D., PARLAK M.  
Applied Physics A: Materials Science and Processing, vol.126, no.8, 2020 (SCI-Expanded)
- XXII. **Temperature dependent band gap in SnS<sub>2</sub>xSe(2-2x) (x = 0.5) thin films**  
Delice S., Isik M., Gullu H., Terlemezoglu M., Surucu O. B., HASANLI N., PARLAK M.  
Materials Science in Semiconductor Processing, vol.114, 2020 (SCI-Expanded)
- XXIII. **Material and Si-based diode analyses of sputtered ZnTe thin films**  
Gullu H., Surucu O. B., Isik M., Terlemezoglu M., PARLAK M.  
Journal of Materials Science: Materials in Electronics, vol.31, no.14, pp.11390-11397, 2020 (SCI-Expanded)
- XXIV. **Temperature-dependent material characterization of CuZnSe<sub>2</sub> thin films**  
Gullu H., Surucu O., Terlemezoglu M., Isik M., Ercelebi C., HASANLI N., PARLAK M.  
Thin Solid Films, vol.701, 2020 (SCI-Expanded)
- XXV. **Characterization of one-step deposited Cu<sub>2</sub>ZnSnS<sub>4</sub> thin films derived from a single crystalline powder**  
Peksu E., Terlemezoglu M., PARLAK M., Karaağaç H.  
Renewable Energy, vol.143, pp.1133-1142, 2019 (SCI-Expanded)
- XXVI. **Determination of current transport characteristics in Au-Cu/CuO/n-Si Schottky diodes**  
Sürücü Ö., Güllü H., Terlemezoglu M., Yildiz D., PARLAK M.  
Physica B: Condensed Matter, vol.570, pp.246-253, 2019 (SCI-Expanded)
- XXVII. **Investigation of electrical characteristics of Ag/ZnO/Si sandwich structure**  
Gullu H., Bayraklı Sürücü Ö., Terlemezoglu M., Yildiz D., PARLAK M.  
Journal of Materials Science: Materials in Electronics, vol.30, no.16, pp.15371-15378, 2019 (SCI-Expanded)
- XXVIII. **Temperature dependence of band gaps in sputtered SnSe thin films**  
Delice S., Isik M., Gullu H., Terlemezoglu M., Bayraklı Surucu O., PARLAK M., HASANLI N.  
Journal of Physics and Chemistry of Solids, vol.131, pp.22-26, 2019 (SCI-Expanded)
- XXIX. **CZTSSe thin films fabricated by single step deposition for superstrate solar cell applications**  
Terlemezoglu M., Bayraklı Sürücü Ö., Dogru C., Güllü H., ÇİFTPINAR E. H., Ercelebi Ç., PARLAK M.  
Journal of Materials Science: Materials in Electronics, vol.30, no.12, pp.11301-11306, 2019 (SCI-Expanded)
- XXX. **Frequency effect on electrical and dielectric characteristics of In/Cu<sub>2</sub>ZnSnTe<sub>4</sub>/Si/Ag diode structure**  
Gullu H., Bayraklı Sürücü Ö., Terlemezoglu M., Yildiz D., PARLAK M.  
Journal of Materials Science: Materials in Electronics, vol.30, no.10, pp.9814-9821, 2019 (SCI-Expanded)
- XXXI. **Temperature dependence of electrical properties in In/Cu<sub>2</sub>ZnSnTe<sub>4</sub>/Si/Ag diodes**  
Gullu H., Yildiz D., Bayraklı Sürücü Ö., Terlemezoglu M., PARLAK M.  
Bulletin of Materials Science, vol.42, no.2, 2019 (SCI-Expanded)
- XXXII. **Construction of self-assembled vertical nanoflakes on CZTSSe thin films**  
Terlemezoglu M., Bayraklı Sürücü Ö., ÇOLAKOĞLU T., Abak M., Güllü H., Ercelebi C., PARLAK M.  
Materials Research Express, vol.6, no.2, 2019 (SCI-Expanded)
- XXXIII. **Analysis of current conduction mechanism in CZTSSe/n-Si structure**  
Terlemezoglu M., Bayraklı Ö., Güllü H., ÇOLAKOĞLU T., Yildiz D., PARLAK M.  
Journal of Materials Science: Materials in Electronics, vol.29, no.7, pp.5264-5274, 2018 (SCI-Expanded)
- XXXIV. **Investigation of carrier transport mechanisms in the Cu-Zn-Se based hetero-structure grown by**

### **sputtering technique**

Güllü H., Terlemezoğlu M., Bayraklı Ö., Yıldız D., PARLAK M.

Canadian Journal of Physics, vol.96, no.7, pp.816-825, 2018 (SCI-Expanded)

XXXV. **Investigation of precursor sequence and post-annealing effects on the properties of Cu<sub>2</sub>SnZnSe<sub>4</sub> thin films deposited by the elemental thermal evaporation**

Bayraklı Ö., Terlemezoğlu M., Güllü H., PARLAK M.

Materials Research Express, vol.4, no.8, 2017 (SCI-Expanded)

XXXVI. **Deposition of CZTSe thin films and illumination effects on the device properties of Ag/n-Si/p-CZTSe/In heterostructure**

Bayraklı Ö., Terlemezoğlu M., Güllü H., PARLAK M.

Journal of Alloys and Compounds, vol.709, pp.337-343, 2017 (SCI-Expanded)

### **Articles Published in Other Journals**

I. **A Study on the Structural, Morphological and Optical Properties of Cu<sub>2</sub>-xSe Thin Films Deposited by Thermal Evaporation**

TERLEMEZOĞLU M.

Bilecik Şeyh Edebali Üniversitesi Fen Bilimleri Dergisi, vol.8, no.2, pp.1057-1063, 2021 (Peer-Reviewed Journal)

### **Refereed Congress / Symposium Publications in Proceedings**

I. **A Study on Tetragonal-star like Shaped Inverted Pyramid Texturing**

Donercark E., ÇİFTPINAR E. H., Terlemezoğlu M., ÇOLAKOĞLU T., TURAN R.

48th IEEE Photovoltaic Specialists Conference, PVSC 2021, Florida, United States Of America, 20 - 25 June 2021, pp.219-221

II. **Transfer of ordered and disordered Si nanowires onto alien substrates for the fabrication of third-generation solar cells**

Karaağaç H., Güller Ö., Peksu E., Humali E., Terlemezoğlu M., PARLAK M., Islam S.

2019 Micro- and Nanotechnology (MNT) Sensors, Systems, and Applications XI Conference, Maryland, United States Of America, 14 - 18 April 2019, vol.10982

### **Supported Projects**

Terlemezoğlu Bilmiş M., Kocahan Yılmaz Ö., TÜBİTAK Project, Multipl Skleroz Hastalarında Eritrosit Morfolojilerinin Kantitatif Faz Görüntüleme Yöntemiyle Belirlenmesi, 2022 - 2025

Terlemezoğlu Bilmiş M., Sarica E., TÜBİTAK Project, Yakın Kızılötesi Bölgede Geçirgenliği Artırılmış Saydam İletken Oksit Malzemelerin Büyütülmesi Ve Sb<sub>2</sub>Se<sub>3</sub> Tabanlı Güneş Hücrelerine Uygulanması, 2021 - 2023

Sürücü Ö., Özen Y., Gencer A., Sürücü G., Kara İ., Terlemezoğlu M., Parlak M., Terlemezoğlu Bilmiş M., TÜBİTAK Project, Cu-Sb-Chalcogen (Cu-Sb-Se) Thin Film Hetero-Joint Fabrication And Photovoltaic Applications, 2021 - 2023