Prof. Dr. Murat KURUDİREK

Kişisel Bilgiler

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Eğitim Bilgileri

Doktora, Atatürk Üniversitesi, Fen Bilimleri Enstitüsü, Fizik, Türkiye 2005 - 2011

Biyografi

Dr. Kurudirek is a Professor of Physics in Vocational School of Technical Sciences at Ataturk University. Dr. Kurudirek completed his Ph. D in 2011 and his studies fall within the scope of Nuclear Science &Technology. He was awarded to a post doctoral research fellowship by TUBITAK in 2013 and with this fellowship he conducted research on neutron measurements in Georgia Institute of Technology, USA between 2013 and 2015. His primary research interest is based on radiation detection, shielding, dosimetry, development of novel radiation detector materials. He has been an author of over 70 publications most of which were published in SCI indexed journals. He has been awarded several internal awards by Ataturk University between 2010 and 2020. He was awarded as Professor Sevket Erk Young Scientist by Turkish Physical Society in 2011. He took place in PLOS Biology Top Scientists List both in 2020 and 2021. He is currently a Marie-Sklodowska Curie Fellow sponsored by the European Commission under the Horizon 2020 program. With his Horizon 2020 funded project, which will be mentored by the world renown scientists from USA and UK, he will focus on developing novel nuclear detector materials based on nanotechnology.

Yabancı Diller

İngilizce, B2 Orta Üstü

Yaptığı Tezler

Doktora, Bazı çoklu element yapıdaki maddelerin foton etkileşimi, foton enerji soğurması, foton kuvvetlendirme faktörü ve hızlı nötron azaltma tesir kesitleri açısından incelenmesi, Atatürk Üniversitesi, Fen Bilimleri Enstitüsü, Fizik, 2011

Araştırma Alanları

Fizik, Atom ve Molekül Fiziği, Atomik Özellikler ve Fotonla Etkileşmeler, Disiplinlerarası Fizik ve İlgili Bilim ve Teknoloji Alanları, Biyolojik ve tıbbi fizik, Nükleer mühendislik ve nükleer enerji çalışmaları, Temel Bilimler

Akademik Unvanlar / Görevler

Prof. Dr., Atatürk Üniversitesi, Erzurum Meslek Yüksekokulu, Elektrik ve Enerji, 2020 - Devam Ediyor
Doç. Dr., Atatürk Üniversitesi, Fen Fakültesi, Fizik, 2014 - 2020
Yrd. Doç. Dr., Atatürk Üniversitesi, Fen Fakültesi, Fizik, 2011 - 2014
Araştırma Görevlisi, Atatürk Üniversitesi, Fen Bilimleri Enstitüsü, Fizik Anabilim Dalı, 2006 - 2011

Akademik İdari Deneyim

Atatürk Üniversitesi, Fen Fakültesi, Fizik, 2012 - 2014

SCI, SSCI ve AHCI İndekslerine Giren Dergilerde Yayınlanan Makaleler

I. **Solution processed high aspect ratio ultra-long vertically well-aligned ZnO nano scintillators for potential X-ray imaging applications**
Kurudirek S. V., KURUDİREK M., Erickson A., Hertel N., Sellin P. J., Tratsiak Y., Lawrie B. J., Melcher C. L., Summers C. J.
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II. **Vertically Well-Aligned ZnO Nanoscintillator Arrays with Improved Photoluminescence and Scintillation Properties**
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Materials, cilt.16, sa.20, 2023 (SCI-Expanded)

III. **The differential scattering parameters of different types of materials in Compton energy region for nuclear applications**
Buyukyildiz M., Tuna G., Kurudirek M.
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IV. **Study of low-energy photon interactions below 1 keV for some biological molecules of human body**
Mohammad Rafiei M., Parsaei S., Kaur P., Singh K. J., Buyukyildiz M., KURUDİREK M.
EUROPEAN PHYSICAL JOURNAL PLUS, cilt.137, sa.2, 2022 (SCI-Expanded)

V. **Structural investigations and nuclear radiation shielding ability of bismuth lithium antimony borate glasses**
Kaur P., Singh K., Thakur S., KURUDİREK M., Rafiei M. M.
JOURNAL OF PHYSICS AND CHEMISTRY OF SOLIDS, cilt.150, 2021 (SCI-Expanded)

VI. **A detailed investigation of gamma-ray energy absorption and dose buildup factor for soft tissue and tissue equivalents using Monte Carlo simulation**
Rafiei M. M., Tavakoli-Anbaran H., KURUDİREK M.
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VII. **A Monte Carlo study on the gamma-ray buildup factors for the linear sources embedded in a cylindrical shield**
Rafiei M., Parsaei S., KURUDİREK M.
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VIII. **Investigation of a competent non-toxic Bi2O3- Li2O-CeO2- MoO3- B2O3 glass system for nuclear radiation security applications**
Kaur P., Singh K. J., Thakur S., KURUDİREK M.
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IX. **Investigation of some nuclear engineering materials in terms of gamma ray buildup factors at experimental energies used in nuclear physics experiments**
Kurudirek M., Kurucu Y.
Radiation Effects and Defects in Solids, cilt.175, ss.640-656, 2020 (SCI-Expanded)

X. **Radiation shielding properties of bismuth borate glasses doped with different concentrations of cadmium oxides**
Alajerami Y., Drabold D., Mhareb M., Cimatu K. L. A., Chen G., Kurudirek M.
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XI. **Phy-X/ZeXTRa: a software for robust calculation of effective atomic numbers for photon, electron, proton, alpha particle, and carbon ion interactions**
Özpolat Ö. F., Alım B., Şakar E., Büyükyıldız M., Kurudirek M.
RADIATION AND ENVIRONMENTAL BIOPHYSICS, cilt.59, sa.2, ss.321-329, 2020 (SCI-Expanded)

XII. **Phy-X / PSD: Development of a user friendly online software for calculation of parameters relevant to radiation shielding and dosimetry**
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XIII. **Study of environment friendly bismuth incorporated lithium borate glass system for structural, gamma-ray and fast neutron shielding properties**
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XIV. **Estimation of energy absorption buildup factors of some human tissues at energies relevant to brachytherapy and external beam radiotherapy**
KURUDİREK M., KURUCU Y.
INTERNATIONAL JOURNAL OF RADIATION BIOLOGY, cilt.95, sa.12, ss.1685-1695, 2019 (SCI-Expanded)

XV. **Physical, mechanical and gamma-ray shielding properties of highly transparent ZnO-MoO3-TeO2 glasses**
Ersundu M. C., Ersundu A. E., Gedikoğlu N., Şakar E., Büyükyıldız M., Kurudirek M.
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XVI. **Leaded brass alloys for gamma-ray shielding applications**
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XVII. **Synthesis and photoluminescence properties of Ga-doped ZnO nanorods by a low temperature solution method**
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XVIII. **Effect of Bi2O3 on gamma ray shielding and structural properties of borosilicate glasses recycled from high pressure sodium lamp glass**
Kurudirek M., Chutithanapanon N., Laopaiboon R., Yenchai C., Bootjomchai C.
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XIX. **The heavy metal oxide glasses within the WO3-MoO3-TeO2 system to investigate the shielding properties of radiation applications**
ERSUNDU A. E., Buyukyildiz M., Ersundu M. C., ŞAKAR E., KURUDİREK M.
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XX. **Radiological properties of healthy, carcinoma and equivalent breast tissues for photon and charged particle interactions**
Büyükyıldız M., Kurudirek M.
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XXI. **Heavy metal borate glasses: Potential use for radiation shielding**
Kurudirek M.
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XXII. **Determination of radiation shielding parameters of 304L stainless steel specimens from welding area for photons of various gamma ray sources**
Buyukyildiz M., Kurudirek M., Ekici M., İçelli O., Karabul Y.

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XXIII. **Effective atomic number and buildup factor calculations for metal nano particle doped polymer gel**
Sathiyaraj P., Samuel E. J. J., Valeriano C. C. S., Kurudirek M.
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XXIV. **Study of gamma radiation shielding properties of glasses**
Issa S. A. M., Sayyed M. I., Kurudirek M.
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XXV. **Quantitative X-Ray Analysis for Cr-Fe Binary Ferroalloys by Using EDXRF-WDXRF Techniques**
Buyukyildiz M., Boydaş E., Kurudirek M., Orhan E. O.
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XXVI. **Effective atomic number of Mn-Co-Fe2O3 ternary alloys using the Rayleigh to Compton scattering ratio**
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CANADIAN JOURNAL OF PHYSICS, cilt.95, ss.402-406, 2017 (SCI-Expanded)

XXVII. **Effective atomic number of soft tissue, water and air for interaction of various hadrons, leptons and isotopes of hydrogen**
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XXVIII. **A STUDY OF THE EFFECTIVE ATOMIC NUMBER OF SixPb0.7-x(Fe2O3)(0.3) TERNARY ALLOYS FOR PHOTONS**
Buyukyildiz M., Kurudirek M.
NUCLEAR TECHNOLOGY & RADIATION PROTECTION, cilt.31, ss.327-334, 2016 (SCI-Expanded)

XXIX. **A study of effective atomic number and electron density of gel dosimeters and human tissues for scattering of gamma rays: momentum transfer, energy and scattering angle dependence**
Kurudirek M.
RADIATION AND ENVIRONMENTAL BIOPHYSICS, cilt.55, ss.501-507, 2016 (SCI-Expanded)

XXX. **Estimation of effective atomic number in the Rayleigh to Compton scattering ratio using different methods**
Kurudirek M., Buyukyildiz M.
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XXXI. **Effective atomic number, energy loss and radiation damage studies in some materials commonly used in nuclear applications for heavy charged particles such as H, C, Mg, Fe, Te, Pb and U**
Kurudirek M.
RADIATION PHYSICS AND CHEMISTRY, cilt.122, ss.15-23, 2016 (SCI-Expanded)

XXXII. **Water and tissue equivalence properties of biological materials for photons, electrons, protons and alpha particles in the energy region 10keV-1GeV: a comparative study**
KURUDİREK M.
INTERNATIONAL JOURNAL OF RADIATION BIOLOGY, cilt.92, sa.9, ss.508-520, 2016 (SCI-Expanded)

XXXIII. **Investigation of the effective atomic numbers of dosimetric materials for electrons, protons and alpha particles using a direct method in the energy region 10 keV-1 GeV: a comparative study**
KURUDİREK M., AKSAKAL O., Akkus T.
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XXXIV. **Modern utilization of an accurate method for detecting essential elements in whole blood using low energy photons**
Medhat M. E., SHAN W. E., KURUDİREK M.
X-RAY SPECTROMETRY, cilt.44, sa.6, ss.418-425, 2015 (SCI-Expanded)

XXXV. **Studies on heavy charged particle interaction, water equivalence and Monte Carlo simulation in some gel dosimeters, water, human tissues and water phantoms**
Kurudirek M.
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS

DETECTORS AND ASSOCIATED EQUIPMENT, cilt.795, ss.239-252, 2015 (SCI-Expanded)

XXXVI. **Calculation of effective atomic number and electron density of essential biomolecules for electron, proton, alpha particle and multi-energetic photon interactions**
KURUDİREK M., Onaran T.
RADIATION PHYSICS AND CHEMISTRY, cilt.112, ss.125-138, 2015 (SCI-Expanded)

XXXVII. **Collisional, radiative and total electron interaction in compound semiconductor detectors and solid state nuclear track detectors: Effective atomic number and electron density**
KURUDİREK M., Kurudirek S. V.
APPLIED RADIATION AND ISOTOPES, cilt.99, ss.54-58, 2015 (SCI-Expanded)

XXXVIII. **Radiation shielding and effective atomic number studies in different types of shielding concretes, lead base and non-lead base glass systems for total electron interaction: A comparative study**
Kurudirek M.
NUCLEAR ENGINEERING AND DESIGN, cilt.280, ss.440-448, 2014 (SCI-Expanded)

XXXIX. **Effective atomic numbers, water and tissue equivalence properties of human tissues, tissue equivalents and dosimetric materials for total electron interaction in the energy region 10 keV-1 GeV**
Kurudirek M.
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XL. **Effective atomic numbers of different types of materials for proton interaction in the energy region 1 keV-10 GeV**
Kurudirek M.
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION B-BEAM INTERACTIONS WITH MATERIALS AND ATOMS, cilt.336, ss.130-134, 2014 (SCI-Expanded)

XLI. **Effective atomic numbers and electron densities of some human tissues and dosimetric materials for mean energies of various radiation sources relevant to radiotherapy and medical applications**
Kurudirek M.
RADIATION PHYSICS AND CHEMISTRY, cilt.102, ss.139-146, 2014 (SCI-Expanded)

XLII. **Remarks on the extension and validity of an empirical formula for the fast-neutron removal cross-section: The effective atomic weight**
KURUDİREK M., El-Khayatt A. M., Gerward L.
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XLIII. **Robust determination of mass attenuation coefficients of materials with unknown thickness and density**
KURUDİREK M., Medhat M. E.
RADIATION PHYSICS AND CHEMISTRY, cilt.100, ss.65-69, 2014 (SCI-Expanded)

XLIV. **Photon buildup factors in some dosimetric materials for heterogeneous radiation sources**
KURUDİREK M.
RADIATION AND ENVIRONMENTAL BIOPHYSICS, cilt.53, sa.1, ss.175-185, 2014 (SCI-Expanded)

XLV. **Investigation of X- and gamma ray photons buildup in some neutron shielding materials using GP fitting approximation**
KURUDİREK M., SARDARİ D., KHALEDİ N., ÇAKIR C., Mann K. S.
ANNALS OF NUCLEAR ENERGY, cilt.53, ss.485-491, 2013 (SCI-Expanded)

XLVI. **Water equivalence study of some phantoms based on effective photon energy, effective atomic numbers and electron densities for clinical MV X-ray and Co-60 gamma-ray beams**
Kurudirek M.
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT, cilt.701, ss.268-272, 2013 (SCI-Expanded)

XLVII. **A simple method to determine effective atomic numbers of some compounds for multi-energetic photons**
KURUDİREK M., ÇELİK A.
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS

DETECTORS AND ASSOCIATED EQUIPMENT, cilt.689, ss.75-78, 2012 (SCI-Expanded)

XLVIII. **Chemical shifts observed in Lα X-ray emission lines of elements in the range of 26 ≤ Z ≤ 30 in their halogen compounds**
Büyükyıldız M., Boydaş E., Kurudirek M., Orhan E.
Journal Of Radioanalytical And Nuclear Chemistry, cilt.292, ss.467-472, 2012 (SCI-Expanded)

XLIX. **Verification of dosimetric materials to be used as tissue-substitutes in radiological diagnosis**
Mann K. S., KURUDİREK M., Sidhu G. S.
APPLIED RADIATION AND ISOTOPES, cilt.70, sa.4, ss.681-691, 2012 (SCI-Expanded)

L. **Estimation of effective atomic numbers of some solutions for photon energy absorption in the energy region 0.2-1.5 MeV: An alternative method**
Kurudirek M.
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT, cilt.659, sa.1, ss.302-306, 2011 (SCI-Expanded)

LI. **Analysis of some Pb, Th and U compounds in terms of photon interaction, photon energy absorption and fast neutron attenuation**
KURUDİREK M., ÖZDEMİR Y., El-Khayatt A. M.
RADIATION PHYSICS AND CHEMISTRY, cilt.80, sa.8, ss.855-862, 2011 (SCI-Expanded)

LII. **L-shell polarization and alignment of heavy elements induced by 59.54 keV photons**
Özdemir Y., Durak R., Kaçal M. R., Kurudirek M.
Applied Radiation And Isotopes, cilt.69, ss.991-995, 2011 (SCI-Expanded)

LIII. **Investigation of human teeth with respect to the photon interaction, energy absorption and buildup factor**
KURUDİREK M., Topcuoglu S.
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION B-BEAM INTERACTIONS WITH MATERIALS AND ATOMS, cilt.269, sa.10, ss.1071-1081, 2011 (SCI-Expanded)

LIV. **Energy absorption and exposure buildup factors for some polymers and tissue substitute materials: photon energy, penetration depth and chemical composition dependence**
KURUDİREK M., ÖZDEMİR Y.
JOURNAL OF RADIOLOGICAL PROTECTION, cilt.31, sa.1, ss.117-128, 2011 (SCI-Expanded)

LV. **Analysis of some Earth, Moon and Mars samples in terms of gamma ray energy absorption buildup factors: Penetration depth, weight fraction of constituent elements and photon energy dependence**
KURUDİREK M., Dogan B., ÖZDEMİR Y., Moreira A. C., Appoloni C. R.
RADIATION PHYSICS AND CHEMISTRY, cilt.80, sa.3, ss.354-364, 2011 (SCI-Expanded)

LVI. **Gamma-ray energy absorption and exposure buildup factor studies in some human tissues with endometriosis**
KURUDİREK M., DOGAN B., İNGEÇ M., EKİNCİ N., ÖZDEMİR Y.
Applied Radiation and Isotopes, cilt.69, sa.2, ss.381-388, 2011 (SCI-Expanded)

LVII. **A comprehensive study on energy absorption and exposure buildup factors for some essential amino acids, fatty acids and carbohydrates in the energy range 0.015-15 MeV up to 40 mean free path**
KURUDİREK M., ÖZDEMİR Y.
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LVIII. **Comparison of some lead and non-lead based glass systems, standard shielding concretes and commercial window glasses in terms of shielding parameters in the energy region of 1 keV-100 GeV A comparative study**
Kurudirek M., Özdemir Y., Şimşek Ö., Durak R.
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LIX. **A study of chemical composition and radiation attenuation properties in clinoptilolite-rich natural zeolite from Turkey**
KURUDİREK M., Ozdemir Y., TÜRKMEN İ., LEVET A.

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LX. **Chemical composition, effective atomic number and electron density study of trommel sieve waste (TSW), Portland cement, lime, pointing and their admixtures with TSW in different proportions**
KURUDİREK M., AYGÜN M., ERZENEOĞLU S. Z.
APPLIED RADIATION AND ISOTOPES, cilt.68, sa.6, ss.1006-1011, 2010 (SCI-Expanded)

LXI. **Effective atomic number study of various alloys for total photon interaction in the energy region of 1 keV-100 GeV**
KURUDİREK M., Buyukyildiz M., ÖZDEMİR Y.
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LXII. **Determination of effective atomic numbers in some compounds for photoelectric process at 59.54 keV by using different methods**
KURUDİREK M., ÖZDEMİR Y.
JOURNAL OF X-RAY SCIENCE AND TECHNOLOGY, cilt.18, sa.2, ss.183-191, 2010 (SCI-Expanded)

LXIII. **Determination of trace element levels in human blood serum from patients with type II diabetes using WDXRF technique: A comparative study**
DURAK R., GÜLEN Y., KURUDİREK M., KAÇAL M. R., ÇAPOĞLU İ.
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LXIV. **A study of total mass attenuation coefficients, effective atomic numbers and electron densities for various organic and inorganic compounds at 59.54 keV**
ÖZDEMİR Y., KURUDİREK M.
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LXV. **Assessment of trace element concentration distribution in human placenta by wavelength dispersive X-ray fluorescence: Effect of neonate weight and maternal age**
ÖZDEMİR Y., BÖREKÇİ B., LEVET A., KURUDİREK M.
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LXVI. **A study of photon interaction in some building materials: High-volume admixture of blast furnace slag into Portland cement**
KURUDİREK M., Turkmen I., Ozdemir Y.
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LXVII. **Calculation of radiation attenuation coefficients in Portland cements mixed with silica fume, blast furnace slag and natural zeolite**
Turkmen I., ÖZDEMİR Y., KURUDİREK M., Demir F., ŞİMŞEK Ö., Demirboga R.
ANNALS OF NUCLEAR ENERGY, cilt.35, sa.10, ss.1937-1943, 2008 (SCI-Expanded)

LXVIII. **Evaluation of root canal dentin after Nd : YAG laser irradiation and treatment with five different irrigation solutions: A preliminary study**
Gurbuz T., ÖZDEMİR Y., Kara N., Zebir C., KURUDİREK M.
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Diğer Dergilerde Yayınlanan Makaleler

I. **A Monte Carlo investigation of some important radiation parameters and tissue equivalency for photons below 1 keV in human tissues**
Rafiei M. M., Parsaei S., Kaur P., Singh K. J., Buyukyildiz M., KURUDİREK M.
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II. **TiB2 Thin Film Coated Glass and High Speed Steel (HSS) in Applications of Radiation Shielding Technology**
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III. **Gamma-ray and neutron shielding behaviourof CaO-K2O-P2O5 glass system modified withBi2O3**

Kaur P., Singh K. J., Kurudirek M., Thakur S.
AIP Conference Proceedings, cilt.2115, 2019 (Hakemli Dergi)

IV. **Investigation of gamma radiation shielding properties of some zinc tellurite glasses**
Issa S., Sayyed M., Kurudirek M.
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V. **Üç farklı güta perka çözücüde rezin simanların çözünmesi**
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Kitaplar

I. **Chapter 3 - X- and Gamma Ray Interactions with Soft Contact Lenses**
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Advances in Eye Research Volume 1, W. L. Thomsen, Editör, Nova Science Publishers, New Jersey, ss.65-91, 2011

II. **Radiation Interactionwith Blast Furnace Slag: A Comparative Study from the Point of Radiation Shielding**
KURUDİREK M., ÖZDEMİR Y., ELKHAYATT A. M.
Radiation Exposure in Medicine and the Environment Risks and Protective Strategies Chapter 4 Radiation Interaction with Blast Furnace Slag A Comparative Study from the Point of Radiation Shielding pp 75 96, Nicole E. Parnell, Editör, Nova Science Publishers, ss.75-96, 2011

Hakemli Bilimsel Toplantılarda Yayımlanmış Bildiriler

I. **Gamma-ray and neutron shielding behaviour of CaO-K2O-P2O5 glass system modified with Bi2O3**
Kaur P., Singh K., KURUDİREK M., Thakur S.
63rd DAE Solid State Physics Symposium 2018, DAE-SSPS 2018, Hisar, Haryana, Hindistan, 18 - 22 Aralık 2018, cilt.2115

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Metrikler

Yayın: 99
Atıf (WoS): 2845
Atıf (Scopus): 3770
H-İndeks (WoS): 26
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