



CERTIFICATE

OF PRESENTATION

This is to certify that the communication titled:

Improve efficiency of Perovskite-Based Solar Cell by photon recycling

was presented as an **ORAL PRESENTATION** by :

M. Bouras, M. Chahmi, A. Benyounes

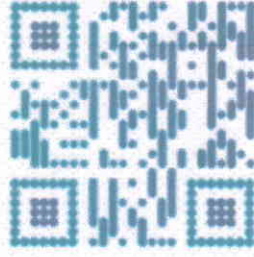
during the Fourth International Conference on Nanomaterials and Applications
(**nanomat2024**), held from 01 to 03 November 2024, in Hammamet, Tunisia.

03.11.2024

DATE

Lassaad BEN HAMMOUDA

Chair of nanoMAT2024



Improve efficiency of Perovskite-Based Solar Cell by photon recycling

Mounir Bouras^a Maroua Chahmi^a Abdelhafid benyounes^b,

^a *Department of Electronics Faculty of Technology university of M'sila*
mounir.bouras@univ-msila.dz

^b *Department of Electrical engineering Faculty of Technology university of M'sila*
abdelhafid.benyounes@univ-msila.dz

Abstract— In recent years, significant advancements have been made in thin-film planar heterojunction solar cells, emerging as cost-effective photovoltaic devices with high power conversion efficiency. Among the materials utilized, organometal trihalide perovskite (CH₃NH₃PbI₃) stands out as a promising absorber material. Its appeal lies in the affordability of organic-inorganic perovskite compounds, readily available in nature, ease of fabrication, and compatibility with large-scale processing at low temperatures [1-2].

In addition to its effective absorption in the ultraviolet range, this material exhibits captivating optoelectronic properties, including high crystallinity, elevated carrier mobility, and extensive carrier diffusion lengths. Despite these advantages, the highest reported power conversion efficiency for perovskite solar cells is currently at 26.1%, as of 2022 [3].

This study introduces a thin-film organometal trihalide perovskite solar cell featuring hybrid interfaces between carefully chosen materials. These selections are the result of an in-depth study aimed at minimizing recombination and optimizing performance. Furthermore, we enhance the absorption of the incident solar spectrum by incorporating a 1D photonic crystal at the cell's bottom, facilitating the photon recycling process.

The proposed solar cell parameters are numerically computed using the rigorous coupled wave algorithm through the SYNOPSIS RSOFT CAD tool. The thickness of each layer in the structure is optimized using the MOST scanning and optimization module of the RSOFT CAD tool, achieving the highest power conversion efficiency at a minimal device thickness (approximately 2.5 μm).

Remarkably, the power conversion efficiency achieved is 27.5%, with a fill factor of 87.4% at AM 1.5, showcasing great promise. This demonstrates the remarkable potential of the proposed design to achieve efficiencies exceeding 5%, positioning it as a competitive contender in the existing crystalline silicon photovoltaic market.

References

- [1] Park, Nam-Gyu; *Materialstoday*, 2015, 18 (2),65-72.
- [2] Yang, WS et al. *Science (AAAS)*, 2017, 356(6345) :1376-1379.
- [3] Lee, S.J. et al.; *J. Am. Chem. Soc.*, 2016, 138 (12), pp 3974–

Fourth Edition



**Association Tunisienne
des Nanomatériaux et Applications**

nano **MAT** **2024**

**4th International Conference on Nanomaterials
and Applications**

01 –03 November 2024, Hammamet, Tunisia

Scientific Program

 : nano-mat.org |  : nanomat@utm.tn

nano MAT 2024

4th International Conference on Nanomaterials
and Applications

1 – 3 November 2024, Hammamet, Tunisia

SCIENTIFIC PROGRAM

Thur. 31 Oct. 2024			
14.30-18.00	REGISTRATION		
Fri. 01 Nov. 2024			
08.00-09.30	REGISTRATION		
09.30-10.00	OPENING CEREMONY		
10.00-10.30	WELCOME RECEPTION		
10.30-11.05	Plenary lecture #1: Prof. Mihai Irimia-Vladu (Session chairman: Prof. Ouassim Ghodbane) Title: The Road to “Green” in Organic Bioelectronics		
11.05-11.40	Plenary lecture #2: Prof. Frederic Favier (Session chairman: Prof.Ouassim Ghodbane) Title: Nano-engineered 2D Materials for Electrochemical Energy Storage		
Oral session I: Room A (Session chairman: P. Lang & A. Boukhouiete)		Oral session I: Room B (Session chairman: H. Ben Youcef & H. Chebbi)	
11.40-11.55	OA1: Exciton Fine Structure of Lead Halide Perovskite Nanocrystals CsPbBr ₃ : an Interplay of Electron-Hole Exchange Interaction, Crytal Structure, Shape Anisotropy and Dielectric Mismatch <u>A. Ghribi</u> , K. Boujdaria, L. Legrand, A. Ghribi	11.40-11.55	OB1: Label-Free Capacitive Detection of Kanamycin Antibiotic Residues in Dairy Products <u>A. Rabti</u> , O. Ghodbane, F. K. Algethami, N. Raouafi
11.55-12.10	OA2: Boosting of CZTS-Based Solar Cells with Cu ₂ S as a Buffer Layer: A Combined Experimental and Simulation Approach <u>A. Akkari</u> , O. kamoun, A. Akkari	11.55-12.10	OB2: Graphitization of olive mill waste biomass by pyrolysis for H ₂ , CH ₄ and CO ₂ gas detection <u>A. Siaï</u> , M. Ben Abdallah, G.Conte, H. Nsir , A. Policicchio

10.10-12.25	OA3: Design and Computational Analysis of Nitrobenzofurazan-Based Non-Fullerene Acceptors for Organic Solar Cells B. Abdelaziz, S. Patane, S. Ayachi	12.10-12.25	OB3: Synthesis and characterisations of nanocomposites PB@NiFe ₂ O ₄ Y. Sabri, N. Hosni, H. Maghraoui-Meherzi
12.30-14.00	LUNCH		
14.00-14.35	Plenary lecture #3: Prof. Sibel Ozkan (Session chairman: Prof. Nouredine Raouafi) Title: Design and Application of Nanomaterial Embedded Molecularly Imprinted Polymers for Electrochemical Sensing: Recent Developments and Future Prospects		
14.35-15.05	LEDlab Presentation – Pedro Hurdato		
15.05-15.40	Plenary lecture #4: Prof. Dongyuan Zhao (Session chairman: Prof. Nouredine Raouafi) Title: Molecular super-assembly for functional mesoporous materials and their future		
15.40-16.40	Coffee break and Poster session I (From P1 to P32)		
Oral session II : Room A (session chairman: D. Debecker and R. Delimi)		Oral session II: Room B (session chairman: H. Maghraoui and A. Hafidh)	
16.40-16.55	OA4: Impact of annealing temperature on morphological, structural, vibrational and electron paramagnetic resonance properties of spinel CoAl ₂ O ₄ A. Bardaoui, I. Dhifallah, M. Daoudi, S. Aouini, R. Chtourou	16.40-16.55	OB 4: Effect of deposition time of cobalt oxide (Co ₃ O ₄) nanowires into stainless-steel substrates on the supercapacitive performance and stability. I. Bouya Ahmed, E. Castillo-Martinez, I. Ben Assaker
16.55-17.10	OA5: Optical characterization of Si/SiO ₂ /HfO ₂ heterostructures Y. Ben Maad, H. Ajlani, M.Oueslati, A. Madouri, A. Meftah	16.55-17.10	OB5: New insights of the adsorption and photodegradation of textile dyes using water-soluble semi-conductor nanocrystals: mechanism, interpretation and statistical physics modeling N. Bel Haj Mohamed

17.10-17.25	OA6: Properties of mesoporous and microporous materials modified by iron nanoparticles as potential catalysts for water purification <u>R. Ouargli Saker</u> , A. K. Lachachi, K. N. Sekkal	17.10-17.25	OB6: Advanced Screening of Autoimmune Diseases: A Machine Learning Approach to Spectroscopic Analysis <u>S. Ben Brik</u> , I. Cherni, S. Hamzaoui
17.25-17.40	OA7: Elimination des micropolluants dans les effluents liquides pharmaceutiques par un bio adsorbant <u>R. Riahi</u> , Hajer Chemingui, W. Ben Salem, N. Benssacia, A. Kettab, A. Hannachi	17.25-17.40	OB7: Development of sensitive and selective electrochemical sensing platform based on AuNPs@CuNPs-supported molecularly imprinted polymer for specific recognition and determination of cefazolin <u>A. Cetinkaya</u> , S. A. Ozkan
17.40-17.55	OA8: Physical approaches of the carrier dynamics involved in the temperature dependence of the luminescence intensity for self-assembled QD systems. <u>J. Rayhani</u> , M. Oueslati, R. Chtourou	17.40-17.55	OB8: Cholesteric liquid crystal as a template for nanoparticle control <u>I. Gharbi</u> , H. Ayeb
Sat. 02 Nov. 2024			
09.00-09.35	Plenary lecture #5: Prof. Sami Boufi (Session chairman: Prof. Mihai Irimia-Vladu) Title: Biobased Nanoparticles from Biomass: A promising platform for Advanced Ecofriendly Functional Materials		
09.35-10.10	Plenary lecture #6: Prof. Mongi Bouaicha (Session chairman: Prof. Mihai Irimia-Vladu) Title: Renewables energies and decarbonization facing the global warming		
10.10-0.40	COFFEE BREAK		
Oral session III: Room A (Session chairman: Lynda Ben Bahouche and Nouari Kebaïli)		Oral session III: Room B (Session chairman: Sami Boufi and Salima Labidi)	
10.40-10.55	OA09: Enhanced Energy Density in Graphene-Based Supercapacitors Modified with Prussian Blue and Carbonaceous Materials <u>S. A. Alsherari</u> , N. Raouafi	10.40-10.55	OB09: Natural Dielectrics for Bio-Organic Electronics <u>C. Vlad Irimia</u> , C. Yumusak, N. Serdar Sariciftci, M. Irimia-Vladu

10.55 – 11.10	OA10: Synthesis and Application of 2D Mono-element Materials in an Energy Harvesting Device <u>N. Ben Brahim Aouani</u>, N. Rachid, O. Bel Hadj Ali, M. Jouini, A. Bali, W. Ouerghi, G. Jemai, L. Linoubli, L. Marty	10.55–11.10	OB10: Computational investigation of structural, elastic, electronic, and optical properties of predicted Alkali Metal-Based Ternary chalcogenides LiNaX (X = Se, Te) for optoelectronics and storage devices applications: DFT study <u>Ly. Benbahouche</u>, S. Boucetta, A. Khelefhoun
11.10–11.25	OA11: Eigen values and eigen functions of an anharmonic oscillator perturbed with different Gaussian profiles potentials <u>A. Bouazra</u>, M. Said	11.10–11.25	OB11: Sol-Gel Autocombustion Process Synthesis and Physico Chemical Characterizations of Copper substituted Cobalt Nickel Ferrite nanoparticles <u>W. Belam</u>
11.25 – 11.40	OA12: New phospholipase A2 enzyme inhibitor <u>A. Hafidh</u>, H. chaabane, F. Touati	11.25–11.40	OB12: Enhanced Energy Conversion and Storage Using Fractal Nanostructures <u>N. Kébaili</u>
11.40–11.55	OA13: A new dipyrenyl calixa zacrown chemosensor for metal cations Selectivity of Mg²⁺ <u>A. Hamdi</u>, L. Baklouti	11.40–11.55	OB13: Biopolymer Ionogels: A Novel Gel Polymer Electrolyte for Asymmetric Supercapacitors <u>S. Abouricha</u>, S. Le Vot, M. Lahcini, O. Ghodbane, F. Favier, H. Ben youcef
11.55–12.10	OA14: Multiferroic NanoMaterials: Synthesis, Characterization and Modelling <u>I. Mallek-Zouari</u>, W. Ben Taazayet, J.-M. Grenèche, L. Bessais, Y. Kaddar, O. Mounkachi, N. Thabet Mliki	11.55–12.10	OB14: Improve efficiency of Perovskite-Based Solar Cell by photon recycling <u>M. Bouras</u>, M. Chahmi,
12.30–14.00	LUNCH		
14.00–14.35	Plenary lecture #7: Prof. Brahim Dkhil (Session chairman: Prof. Sibel Ozkan) Title: Ferroelectrics: from computing devices to energy and environmental applications		
14.35–15.10	Plenary lecture #8: Prof. Damien Debecker (Session chairman: Prof. Sibel Ozkan) Title: Nanocatalysis: a breeze of fresh air		
15.10–16.15	COFFEE BREAK AND POSTER SESSION II (FROM P33 TO P66)		

Oral session IV: Room A (Session chairman: Brahim Dkhil and Laid Makhoulfi)		Oral session IV: Room B (Session chairman: Neila Jebbari and Rachida Ouargli)	
16.15-16.30	OA15: Computational investigation of interfacial charge transfer in dye-sensitized solar cells (DSSCs) <u>C. Saidi</u> , M. Raissi, H. Ghalla, N. Chaaben	16.15-16.30	OB15: The relevance of catalytic silicate and carbon dust surface reactions in the inner solar nebula <u>Y. Guermassi</u> , F. Raouafi, P. Rudolf
16.30-16.45	OA 16: Study of the static and the dynamic correlation of the confined Rydberg dressed atoms systems. <u>N. Grar</u>	16.30-16.45	OB16: The effect of unmodified fumed silica nanoparticles on recycled high-density polyethylene matrix properties using stearic acid as an interface modifier <u>Z. Fouzia</u> , L. Sofiane, W. Steifi
16.45-17.00	OA17: Hydrogen-bonded liquid crystal complexes: Thermal and dielectric properties <u>N. Baccari</u> , M. Ben Salah, H. Ayeb, T. Soltani, U. Maschke, A. Barrera	16.45-17.00	OB17: One-pot synthesis of low-cost CuS/Vulcan carbon composites applied as electrode materials for supercapacitors <u>R. Chniti</u> , S. Pronkin, O. Ghodhbane
17.00-17.15	OA18: Impact of Miniaturization on Electrical Properties of High-k Interface Diodes S. Hlali, N. Hizem, L. Miliatru, A. Souifi, A. Kalbousi	17.00-17.15	OB18: Carbonaceous Nanomaterials for Electrochemical Sensing of Pesticides <u>M. Habib</u> , O. Guellati, F. Abbaci, I. Janowska, J. El-Haskouri and A. Nait-Merzoug
17.15-17.30	OA19: Exploring the structural, mechanical and electronic properties of Fe ₂ CoGa by DFT calculations <u>S. Labidi</u> , M. Labidi, O. Ramdane, S. Belbahi	17.15-17.30	OB19: Development of Molecularly Impressed Polymer-Based Electrochemical Sensor for Ultra-Sensitive and Sensitive Determination of Lincomycin in Beverage Samples <u>F. Budak</u> , A. Cetinkaya, M. Altay Unal, S. A. Ozkan
Sunday 03 Nov. 2024			
09.00-09.35	Plenary lecture #9: Prof. Hicham Ben Youssef (Session chairman: Prof. Frederic Favier) Title: Functionalization of Bio-based materials for Solid Electrolyte: Towards Sustainable Energy Storage		
09.35-10.10	Plenary lecture #10: Prof. Philippe Lang (Session chairman: Prof. Frederic Favier) Title: Grafting and Orientation of Carbazole-based Phosphonic acid Monolayers on conductive metallic oxides; Template for the Growth of Hybrid Perovskite used in solar cells		

Oral session V: Room A (Session chairman: Redouane Miloua and Mohsen Trabelsi)		Oral session V: Room B (Session chairman: Abdelwaheb Hamdi and Fouzia Zoukrami)	
10.10-10.25	OA20: Correlation between structure, acidity and catalytic performances of tungstate catalysts for microwave assisted hemicelluloses hydrolysis. I. Belkadhi, L. Ben Hammouda, Z. Ksibi	10.10-10.25	OB20: All solid-state Laser-Induced Graphene-Based Microsupercapacitor Modified with Poly(Methylene blue) for improved Energy Storage A. Raouafi, N. Raouafi
10.25-10.40	OA21: Effect of active layer thickness on the charge recombination and dissociation in bulk heterojunction polymer solar cells under open circuit conditions R. Abdallah, M. Radaoui, A. Ben Fredj, S. Romdhane, D. A. M. Egbe, H. Bouchriha	10.25-10.40	OB21: Effect of PLD parameters on Mo (110) thin film properties Title S. Lemlikchi, H. Tahi
10.40-10.55	OA22: Ab initio modeling and design of low dimensional platinum disulfide (PtS ₂) T. Larbi, K. Doll and M. Amlouk	10.40-10.55	OB22: Concentration TTIP Effect on Thickness of Titanium Oxide Nano Layers Synthetized by Spray Pyrolysis and on its Performance as Gas Sensors N. Jebbari, S. Bernardini
10.55-11.10	OA23: Improving Energy Density of Supercapacitors Based on Laser-Induced Graphene Electrodes by Using Cyanide-Bridged MOF Nanomaterials. S. Baachaoui, S. Lahmar, O. Ghodbane, N. Raouafi	10.55-11.10	OB23: Binuclear spin-crossover [Fe(bt)(NCS) ₂] ₂ (bpm) complex: A study using first principles calculations K. Lazaar, F. Aouaini, S. Gueddida
11.10-11.25	OA24: Wurtzite InAs/InP nanowires emitting at telecommunication wavelengths monolithically grown on silicon using VLS method. M. H. Hadj Alouane, H. Khmissi, B. Ilahi, H. Maaref, M. Gendry, G. Patriarche C. Bru-Chevallier, N. Chauvin	11.10-11.25	OB24: Design and conception of an IoT-Controlled UVc Sterilization System M. Souaf, K. Farid, N. Mejdoub, M. Mezhoud
11.25-11.40	OA25: Strain engineered InAs QDs for optoelectronic devices O. Nasr, M.H. Haj Alouane,, B. Ilahi, N. Chauvin, L. Sfaxi, H. Maaref	11.25-11.40	OB25: Temperature effect on some optical and electric properties of a solar cell N. Baba Ahmed
11.40-12.15	CLOSING CEREMONY		

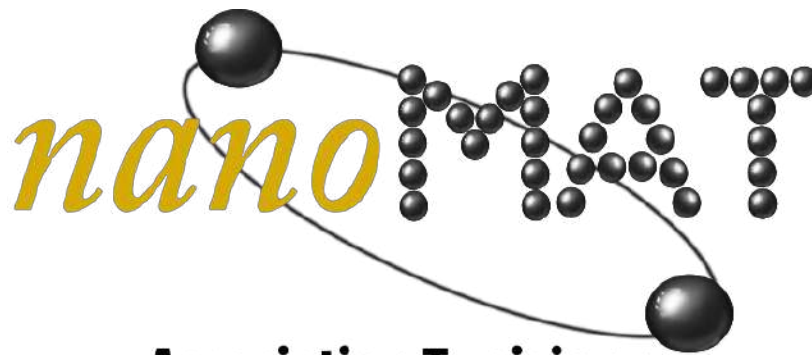
12.30-14.00	LUNCH
Poster session I Fri. 01 November 2024 15.40-16.40	
P1: X-Ray diffraction analysis of nanoparticles A. Sebei, A. Ounis, S. Abdelajaouad	
P2: Efficient Prediction of Modal Indices in Silicon Waveguides Using Machine Learning Techniques A. Ben Younes, M. Bouras	
P3: Nanocrystalline nickel synthesis by pulsed current A. Boukhouiete	
P4: Investigating the impact of Interfacial Layer on the I-V Characteristics of Schottky Diodes based on SiC Polytypes F. Mekaret, B. Zebentout, S. Tizi, Z. Benamara	
P5: Analytical modeling of transport mechanisms in Ti/6H-SiC(n) Schottky diode as function of temperature. A. Bekaddour, El Hachani. Bounab, Schahrazade. Tizi, Baya. Zebentout, Zineb. Benamara	
P6: Optimization of Eco-friendly synthesis of Zinc Oxide Nanoparticles via-Box-Behnken design: Removal of Paracetamol H. Chemingui, W. Ben Salem, H. Dbouba, Rim Ryahia	
P7: Photocatalytic Activity of Co-Zn ferrites nanoparticles in wastewater treatment N. Hosni, W. Selmi, A. Mars, A. Mejri, H. Elfil and Hager Maghraoui-Meherzi	
P8: TiO ₂ quantum dots on TiO ₂ nanotubes: A novel approach to photocatalysis Rawand Rabah, Semy Ben Chaâbène, Zouhaier Ksibi	
P9: Some recent advances in 2D materials using ab initio calculations Koussai Lazaar	
P10: Synthesis, Characterization, and Evaluation of the Antimicrobial Activity of the Magnetic Nanocomposite Fe ₃ O ₄ /HAP Hydroxyapatite MEKAHLIA Leila, HADEF Youcef, MERAH Abdelali, ALLEG SAFIA, DJAHOUDI Heithem	
P11: Nickel Copper Ratio Effect on Nanohybrid Products Electrochemical Performance for Energy Storage M. Bensalem, O. Guellati	
P12: The Study Of based FeCo Nano Powder Using Mössbauer Spectroscopy Mohamed Walid HALIMI, Abderrahim GUITTOUM, Messaoud HEMMOUS, Imen BOUELKREB	
P13: Crystallography of Apatite from Tunisian phosphorite deposits Anouar OUNIS, Abdelaziz SEBEL and Saadi ABDELAJAOUAD	
P14: DFT simulation of structural and electronic properties of SiC/Graphene Interfaces W. Selmi, N. Hosni, J. BenNaceur, and W. Dimassi	
P15: Manganese oxide sprayed thin films as a second absorber layer in CIGS solar cell: Solution concentration effect Wafa Naffouti, Najoua Turki-Kamoun	
P16: Optical selective filters using quasi-periodic photonic crystal based on Si/SiO ₂ S. SAHEL	
P17: Advancing LDPE Properties with Ni Nanoparticles: A Thorough Investigation of Structural, Magnetic, and Mechanical Enhancement Sarah Mouaci, Ahmed Bouremana, Ziane Boutebina, Abdelbasset Berriah, Ammar Manseri, Mohammed Saidi, and Nadia Saidi-Amroun	
P18: Annealing temperature effect on charge recombination and dissociation in bulk hetero-junction polymer solar cells under open circuit conditions S. Smari, M. Radaoui, A. Ben Fredj, S. Romdhane, D. Egbe and H. Bouchriha	
P19: Spectral, crystal structure, DFT/HSA of novel Zwitterion Schiff derivative of DHA Salima Tabti, Tinhinane LOUAICHE, Chaima MAOUCHE, Amel Djedouani, Douniazed Hanachi, Ismail WARAD	
P20: Solvent effects on the electrical and optical properties of SnO ₂ thin films Amina Tioursi, Redouane Miloua, Attouya Bouzidi, Abdelkader Nakrela, Mourad Medles, Mohammed Khadraoui	

P21: Dielectric Relaxation Processes and Magnetic Field Effects in Organic Diode Using a Novel Co-Polymer M. Radaoui, A. Ben Fredj, S. Romdhane, D. Egbe and H. Bouchriha
P22: Quantum-chemical calculations of structure, electronic properties, and spectra of neat PBDB-T:ITIC heterojunctions Montassar Chaabani, Samir Romdhane and Wichard J.D. Beenken
P23: Study of the complexation of the antiviral Ganciclovir by metal ions: Nickel (II), Cobalt (II) and Copper (II) M. Bouali, F. Oueslati
P24: Ni/Fe Hydroxides based Nanohybrid for Energy Storage N. Habib, O. Guellati, A. Nait-Merzoug, J. El Haskouri, A. Harat
P25: Metal Oxides in Catalytic Applications Z. Landolsi, I. Ben Assaker, K. Charradi, R. Chtourou, W. Dimassi
P26: Green synthesis and characterization of platinum nanoparticles loaded with paclitaxel and coated with chitosan: a promising approach for breast cancer treatment M. Y. Al-darwesh, M. Manai, H. Chebbi
P27: Properties of mesoporous and microporous materials modified by iron nanoparticles as potential catalysts for water purification R. Ouargli Saker, A. K. Lachachi, K. N. Sekkal
P28: Investigating the Structural and Electronic Properties of AlN/GaN Superlattices Along (110), (110), and (111) Growth Axes Using First Principles A. Deloum, M. Oukli; H. Abid
P29: Simulation and optimization of highly efficient n-i-p planar Perovskite Solar Cells using SCAPS-1D Software F. Maachou, A. Kadid, B. Zebentout
P30: Synthesis and Characterization of Mn ₃ O ₄ Thin Films: Multifunctional Properties for Optoelectronic and Magnetic Applications M. Hambi, M. Khadraoui, R. Miloua, A. Bouzidi, A. Nakrela, M. Medles, Z. Amara
P31: Impact of Miniaturization on Electrical Properties of High-k Interface Diodes S. Hlali, N. Hizem, L. Miliatru, A. Souifi, A. Kalbousi
P32: Highly Sensitive RGB and HSV-Based Detection of Bromates Using Smartphone A. Adouli, N. Raouafi

Poster session II
Sat. 02 November 2024 | 15.10 - 16.15

P33: Optimization of Graphene Electrodes Preparation for Biosensing Applications A. Raouafi, N. Raouafi
P34: Mineralization of Paraquat aqueous solutions by gamma irradiation A. DHAOUADI, M. BEN SELEM, A. ZAOUAK
P35: Synthesis of CuO/WO ₃ /gC ₃ N ₄ nanocomposite used as a new efficient sensor for the sensitive and selective detection of H ₂ O ₂ E. Fatnassi, A. Nahdi, F. Touati
P36: Systemic scleroderma diagnosis using UV-visible fluorescence I. Cherni, G. Hassen, S. Hamzaoui
P37: Fabrication and Characterization of a Porous Silicon-Based SERS Substrate for Acetamiprid Pesticide Detection S. Kouz, A. Raouafi, N. Lorrain, N. Raouafi, A. Moadhen, M. Guendouz
P38: Cobalt (II)-functionalized graphitic carbon nitride improved laser-induced 3D graphene electrodes for sensitive sensing of diclofenac S. Baachaoui, I. Diedhiou, S. M. A. S. Keshk, N. Raouafi
P39: Sjögren's syndrome diagnosis through in situ investigation of the oral cavity employing frontal optical fluorescence R. Nour, G. Hassen, S. Hamzaoui
P40: Electrochemical Sensing of Levofloxacin and Warfarin Using Laser-Induced Graphene Electrodes Modified with Gold Nanoparticles R. Sahli, G. Landolssi, N. Raouafi
P41: Development of new hybrid nanocomposites for effective photocatalytic degradation of toxic dye pollutants S. Jebri, K. Charradi, M. Hichri
P42: Nanostructured "in-lab" aptasensor for electrochemical detection of vancomycin M. Bibani, N. Ktari, R. Kalfat, A. Blidar, O. Hosu, C. Cristea
P43: Enzymatic biosensor for the detection of pesticides by fluorescence inhibition M. Gatwani, N. Raouafi

P44: First Electrochemical Bioplatfrom for Personalized 5-Fluorouracil Chemotherapy Assistance M. Zouari, N. Raouafi
P45: Solar photoreactor photocatalytic/adsorbents based on doped and functionalized zinc oxide nanocomposites for the solar degradation of phenols in water samples S. Arfaoui, G. Plantard, A. Mars
P46: Efficient electrochemical nanoplatfrom based on gold nanofoam modified polypyrrol decorated with tungsten disulfide for the quantification of heavy metals in water A. Mejri, W. Selmi, A. Mars
P47: Highly Efficient Catalytic Performances for Nitro Aromatic Compounds Removal via Environmentally Friendly Polyvinyl Alcohol/ Silver Nanocomposites Synthesized through Gamma Irradiation A. Zaouak, M. Feraig, H. Jelassi
P48: Enhanced Efficiency of Free Convection in Al ₂ O ₃ -Ag-CuO Ternary Hybrid Nanofluid inside closed Differential-Heated Domain A. Trodi, M. El Hocine Benhamza
P49: Zinc stannate ZnSnO ₃ sprayed thin film synthesis for photocatalytic degradation of methylene blue (MB) dye C. Boukaous, S. Laiche, N. Selmi
P50: Performance of PVK: ZnSe nanomaterial: solar cell application A. Ben chaabane
P51: Investigation of the Optical and Structural Properties of Er ³⁺ Doped Oxyfluoride Glass for Laser Applications R. Fartas, M. Diaf, B. Hani, B. Bitam
P52: Effect of AnnealingTemperature on Structural, Optical and Morphological properties of ZnTiO ₃ provskite deposited on porous silicon and its photocatalytic Application K. Hammedi, S. Aouida, H. Ezzaouia
P53: Biomaterials Synthesis for environmental application H. Araissia, A. Nait-Merzoug and O. Guellati
P54: Novel electrocatalyst based on silver nanowires modified reduced graphene oxide functionalized with PEDOT/PSS for the efficient quantification of carbofuran pesticide in various samples A. Mejri, I. Dhaouadi, C. Inghrosso, A. Mars
P55: Investigation of methylene blue Adsorption by Fe ₃ O ₄ Nanoparticles: An Optimization Study Using Response Surface Methodology I. Gritli, H. Chemingui, K. Djebali, W. Mabrouk, A. Hafiane, R. Marzouki, S. Ammar, R. Chtourou, S.M.A.S. Keshk
P56: Electrocatalytic oxygen reduction over polypyrrole/iron electrode modified by gold nanoparticle susing electrochemical cementation process H. Hammache, L. Makhloufi, N. Brinis, K. Aoudia, T. Bezghiche-Imloul, F. Larfi Djerada, D. Amoura, A. Zaabar
P57: Activated biochar for anionic dye removal M. Diffallah, A. Nait-Merzoug, O. Guellati
P58: Synthesis, characterization and application of ZnO/zeolite X nanocomposite from Tunisian clay A. Hamzaoui, N. Raouafi
P59: Gas detection on polar ZnO surfaces and Graphene/ZnO heterostructure: A DFT Approach Y. Essid, F. Raouafi
P60: Enhancing the performance of proton exchange membranes: Incorporating layered double hydroxides into low sulfonated polyether sulfone octyl sulfonamide composite membranes I. Ben Kacem, W. Mabrouk, K. Charradi, N. Bellakhal, R. Marzouki, N. Raouafi, S.M.A.S. Keshk
P61: Optimization of batch and electrosorption of Cr(VI) from wastewater using Al ₂ O ₃ nanoparticles W. Sassi, N. Mnasri, R. Msaadi, S. Ammar
P62: Cost-Effective Ceratonia Siliqua for Paracetamol Removal: Equilibrium, Regeneration Studies, and Modeling via Box-Behnken Design H. Chemingui, W. Ben Salem, N. Bensacia, A. Hannechi, H. Dbouba, R. Riahi
P63: Elimination des micropolluants dans les effluents liquides pharmaceutiques par un bio adsorbant R. Riahi, H. Chemingui, W. Ben Salem, N. Benssacia, A. Kettab, A. Hannachi
P64: Growth and Characterization of Cadmium Carbonate Nanowires M. Ouassini Bensaid, R. Miloua,
P65: Synthesis of a new cement from waste glass powder and hydrated cement R. Ouargli Saker, N. Kouadri, L. Saker
P66: Structural, morphological, optical and dielectric properties of ZnAl ₂ O ₄ nanoparticles prepared by sol gel auto-combustion technique Mohsen Elain Hajlaoui, Mohamed Amghar, E. Dhahri.



Association Tunisienne des Nanomatériaux et Applications

