Name: Alla Zak, Ph.D.

HIT – Holon Institute of Technology
Date: 1st July 2024

CURRICULUM VITAE

1. Personal Details

Permanent Home Address: 14 Hertzog St., Rehovot, Israel

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2. Higher Education

A. Undergraduate and Graduate Studies

Period of Study	Name of Institution and Department	Degree	Year of Approval of Degree
1996-2002	Weizmann Institute of Science, Faculty of Chemistry, Department of Materials and Interfaces	Ph.D. in Materials Science	5/12/2002
1978-1985	University of Kishinev, Faculty of Physics, Department of Semiconductor Physics, Moldova; Moscow State Pedagogical University, Faculty of Physics, Russia	B.Sc. and M.Sc. in Physics/Physics of Semiconductors/ Physics Teaching*	19/6/1985

* Thesis: The study of mechanism for high temperature edge luminescence of $ZnSe/Al_20_3$ epitaxial films (Supervisor: Prof. E.A. Senokosov)

3. Academic Ranks and Tenure in Institutes of Higher Education

Dates	Name of Institution and Department	Rank/Position
2/4/2022	HIT – Holon Institute of Technology, Faculty of Sciences	Full Professor
13/5/2016-2/4/2022	HIT – Holon Institute of Technology, Faculty of Sciences	Associate Professor
1/3/2012-13/5/2016	HIT – Holon Institute of Technology, Faculty of Sciences	Equivalent to Senior Lecturer

4. Offices in Academic Administration

1/10/2022-	Acting Dean, Faculty of Sciences, HIT
2022	Chair – Committee for reduction of teaching load following research/creativity and quality of teaching, HIT
1/2019-1/2022	Head – Institute Excellence Committee, HIT
2012-present	Head – Laboratory for Synthesis and Investigation of Nanomaterials, HIT
2002-present	Scientific Adviser – Department of Molecular Chemistry and Materials Science, Weizmann Institute of Science

5. Scholarly Positions and Activities outside the Institution

a. Reviewer - Journals:

7/2022	Chemistry of Materials
8/2021	Acts Biomaterialia
8/2021	Israel Journal of Chemistry
7/2021	Nanomaterials
4/2020	Chemistry – An Asian Journal
4/2019	Composites Science & Technology
1/2019; 9/2019	American Chemistry Society – ACS Nano
4/2018	Physical Chemistry Chemical Physics
3/2018	Surface Topography: Metrology and Properties – STMP
12/2017	Crystals
11/2017	MDPI – Metals Journal
8/2017	Sensors
2/2016	Lubricants
7/2015	Carbon
9/2014	The Journal of Physical Chemistry
3/2014	Inorganics
8/2013;1/2016	Lubrication Science
1/2013; 4/2018	Materials Chemistry and Physics
11/2012	International Journal of Applied Ceramic Technology

b. Reviewer – Research Proposal:

3/2014	Reviewer for research proposal – The Israel Science Foundation (ISF)

5. Scholarly Positions and Activities outside the Institution, contd.

c. Miscellaneous

2022	Member of Topical Advisory Panel, Nanomaterials Journal
2022	Member of Editorial Board, Functional Composite Materials published by Springer Nature
10/2021	Examiner of Tzuriel Levin's doctoral dissertation supervised by Prof. Jean-Paul (Moshe) Lellouche, Ben-Gurion University of the Negev, Israel
2019	Invited Member of Editorial Board – New multidisciplinary journal: SN Applied Sciences, part of Springer Nature
5/2018	Examiner of Hagit Sade's doctoral dissertation supervised by Prof. Jean-Paul (Moshe) Lellouche, Ben-Gurion University of the Negev, Israel

6. Participation in Scholarly Conferences

a. Active Participation in Israel

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
25-27/11/2019	First Israel-Italy Workshop on 2D Materials, Bar-Ilan University	Ramat Gan, Israel		Session Chair
6/5/2018	4th International Symposium: Nanotechnology from Academia to Industry 2018 (NTAI-2018), HIT	Holon, Israel		Session Chair: Nanocoatings and Nanoparticles
13/1/2015	Reshef Tenne 70th Birthday Symposium – Inorganic Nano-tubes and Fullerene-like Materials – At the Crossroad of Solid State Chemistry, Nanotechnology and Industrial Applica-tions, Weizmann Institute of Science	Rehovot, Israel		Chair
19-23/10/2014	Israel-Greece Joint Meeting on Nanotechnology and BioNanoscience, Weizmann Institute of Science	Rehovot, Israel		Session Chairman: Nanomaterials 1. Session Chairman: Poster Sessions 1 & 3

6. Participation in Scholarly Conferences, contd.

a. Active Participation in Israel

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
19-21/11/2012	COINAPO 2012 Meeting – Composites of Inorganic Nanotubes and Polymers: Nanocomposites of Inorganic Fullerenes/ Nanotubes, Their Characterization, Properties and Testing (Cost Action MP0902), Weizmann Institute of Science	Rehovot, Israel		Co-Chair

b. Active Participation Abroad

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
9-13/1/2023	5th HeteroNanoCarb 2023: Advances and Applications in Carbon Related Nanomaterials: From Pure to Doping including Heteroatom Layers	Benasque (Aragon), Spain		Session Chairperson
18-19/10/2012	"Nanocon 012" – 2nd International Conference – Nanotechnology: Innovative Materials, Processes Products and Applications	Pune, India		Session Chairperson – Nano Sensor and Nano Biotechnology

c. Organization of Conferences or Sessions in Israel

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
14-15/6/2023	6th International Symposium: Nanotechnology from Academia to Industry 2023 (NTAI-2023)	Holon, Israel		Member of Organizing Committee

6. Participation in Scholarly Conferences, contd.

c. Organization of Conferences or Sessions in Israel

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
24-25/8/2022	5th International Symposium: Nanotechnology from Academia to Industry 2020 (NTAI-2020), Holon Institute of Technology,	Holon, Israel		Chair of Organizing Committee
6/5/2018	4th International Symposium: Nanotechnology from Academia to Industry 2018 (NTAI-2018), HIT	Holon, Israel		Member of Organizing Committee
8/5/2016	2nd International Symposium Nanotechnology from Academy to Industry (NTAI 2016) – In Honor of Prof. Lev Rapoport and Prof. Boris Fainberg, HIT - Holon Institute of Technology	Holon, Israel		Member of Organizing Committee
7-9/7/2015	Flatlands Beyond Graphene, Bar-Ilan University,	Ramat Gan, Israel		Member of Organizing Committee
19-23/10/2014	Israel-Greece Joint Meeting on Nanotechnology and BioNanoscience, Weizmann Institute of Science	Rehovot, Israel		Member of Organizing Committee

d. Organization of Conferences or Sessions Abroad

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
27-30/8/2023	International Conference on Functional Nanomaterials and Nanodevices (NANOMAT 2023)	Warsaw, Poland		Member of Organizing Committee
5-7/9/2022	International Conference on Functional Nanomaterials and Nanodevices (NANOMAT 2020)	Bratislava, Slovakia		Member of Organizing and Scientific Committee

6. Participation in Scholarly Conferences, contd.

d. Organization of Conferences or Sessions Abroad

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
25-29/6/2022	CIMTEC 2022 - 9th Forum on New Materials	Perugia, Italy		Member of International Advisory Board
30-31/10/2021 (postponed)	5th International Conference NANOCON 2020	Pune, India		Invited Member of International Advisory Committee
6-8/9/2021	International Online Conference on Functional Nanomaterials - 2021 Nano-technology Conference	Bratislava, Slovakia		Member of Organizing and Scientific Committee
18-20/8/2021 (postponed)	International Conference Advances in Functional Materials – AAAFM-UCLA, University of California Los Angeles	CA, USA		Invited Member of Advisory/Organizing Committee
21-29/9/2020 (postponed)	CIMTEC 2020 – 9th Forum on New Materials	Montecatini Terme, Italy		Member of International Advisory Board
11-13/9/2019	NANOMAT 2019: International Conference on Functional Nanomaterials and Nanodevices	Prague, Czech Republic		Member of Scientific/Organizing Committee
25-26/10/2018	4th International Conference - NANOCON 18: "Nanotechnology-Applications, Advances and Innovations"	Pune, India		International Advisory Committee Member
25-28/10/2016	2nd Israel- Greece Joint Meeting in Nanotechnology and Bio-Nanoscience	Heraklion, Crete		Member of Poster Committee

6. Participation in Scholarly Conferences, contd.

d. Organization of Conferences or Sessions Abroad

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
5-9/6/2016	5th International Conference Smart and Multi-functional Materials Structures & Systems, and 11th International Conference Medical Applications of Novel Biomaterials & Nanotechnology (CIMTEC 2016)	Perugia, Italy		Member of Organizing Committee

6. Participation in Scholarly Conferences

e. Oral and Poster Presentations in Israel

11/2021 IVS-IPSTA 2021 – 39th Annual Conference of the Israel Vacuum Society jointly with Israeli Conference on Plasma Science and Applications, 17 November 2021 [online]
Poster presentation: Synthetic route towards scalable production in pure phase of WS_2 and MoS_2 inorganic nanotubes and their unusual properties (A. Zak, S. Ghosh, C. Pallellappa, T. Livneh, I. Kaplan-Ashiri, Y. Zhang, Y. Iwasa, V. Bruser, A. Di Bartolomeo)

10/2021 NANO.IL.2021 – Leading International Nanotechnology Conference, Jerusalem, Israel, 4-6 October 2021
Poster presentation: Synthetic route towards pure phase of WS_2 and MoS_2 inorganic nanotubes and their unusual properties (S. Ghosh, P. Chithaiah, T. Livneh, I.Y. Zhang, Y. Iwasa, V. Bruser, I. Kaplan-Ashiri, A. Di Bartolomeo, A. Zak)

12/2020 IVS-IPSTA 2020 – 38th Annual Conference of the Israel Vacuum Society jointly with Israeli Conference on Plasma Science and Applications, 13 December 2020 [online]
Oral presentation: Synthetic route towards pure phase of WS_2 and MoS_2 inorganic nanotubes and their unusual properties (A. Zak, G. Ghosh, C. Pallellappa, T. Livneh, I. Kaplan-Ashiri, Y. Zhang, Y. Iwasa, V. Bruser, A. Di Bartolomeo)

10/2018 NANO.IL.2018 – International Nanotechnology Conference, Jerusalem, Israel, 9-11 October 2018
Poster presentation: Cathodoluminescence studies of single to Penta-wall WS_2 nanotubes obtained through plasma treatment of WS_2 multiwall nanotubes (S. Ghosh, R. Popovitz-Biro, I. Ashiri-Kaplan, V. Brüser, A. Zak)

7/2015 Flatlands Beyond Graphene 2015, Bar Ilan University, Tel-Aviv, Israel, 7-9 July 2015
Oral presentations:
1. Plasma treatment of MWINT-WS_2 for synthesis of single wall nanotubes of WS_2 and for hydrogen storage (A. Zak, A. Laikhtman, R. Popovich Biro, R. Tenne, V. Brueser)
2. Raman scattering from single WS_2 nanotubes embedded within stretched PVDF microfibers (O. Grinberg, R. Avrahami, E. Zussman, T. Livneh, A. Zak)

6. Participation in Scholarly Conferences, contd.

e. Oral and Poster Presentations in Israel

4/2014 COMPO 2014 - Research Workshop of the Israel Science Foundation Nanocomposites and Biocomposites, Weizmann Institute of Science, Rehovot, Israel, 28 April-1 May 2014
Poster presentation: Inorganic (WS_2) fullerene-like nanoparticles and multiwall nanotubes and their application in novel polymer nanocomposites

3/2014 NANOISRAEL 2014 - The 4th International Nanotechnology Conference and Exhibition, David InterContinental Hotel, Tel-Aviv, Israel, 24-25 March 2014
Poster presentation: Inorganic (WS_2) multiwall nanotubes and fullerene-like nanoparticles and their application in novel polymer nanocomposites

9/2013 IVS 2013 – The 31st Israel Vacuum Society Conference, Herzliya, Israel, 30 September 2013
Oral presentation: Single to triple-wall WS_2 nanotubes by high energy plasma treatment of multiwall nanotubes
(V. Brueser, A. Zak, R. Popovitz-Biro, A. Albu-Yaron, R. Tenne)

3/2012 NanoIsrael-12 – The 3rd International Nanotechnology Conference and Exhibition, Weizmann Institute of Science, Rehovot, Israel, 26-27 March 2012
Poster presentation: Influence of inorganic WS_2 nanoparticles on the tribological properties of epoxy resin
(A. Zak, M. Schneider, A. Moshkovich, H. Dodiuk, S. Kenig, R. Tenne, L. Rapoport)

6/2011 Israeli Air Force Workshop on Nanotechnology, Herzlia, Israel
Oral presentation Applications of the inorganic fullerene-like nanoparticles (IF) and nanotubes (INT)

6/2010 ICME2010 – The 31st Israeli Conference on Mechanical Engineering, Tel-Aviv, Israel, 2-3 June 2010
Oral presentation: Advanced Ni/IF-WS_2 nanoparticles coating and its frictional characterization

4/2010 TMCN10 – Transition Metal Chalcogenide and Halide Nanostructures, Weizmann Institute of Science, Rehovot, Israel, 25-27 April 2010
Oral presentation: Recent progress in the synthesis and applications of WS_2 nanotubes
(A. Zak, L. Ecker, M. Schneider, R. Efrati, H. Reem, N. Fleischer)

3/2010 Magnet Consortium, Chief Scientists of the Ministry of Trade & Industry, Tel-Aviv, Israel
Oral presentation: The effect of inorganic nanoparticles on polymer properties

2/2008 ForeMost EU-FP6 Consortium, Israel
Oral presentation: Industrial technology for scaling up IFLM synthesis

6. Participation in Scholarly Conferences, contd.

f. Oral and Poster Presentations Abroad

9/2019 7th International Conference Flatlands Beyond Graphene, Toulouse, France, 2-6 September 2019
Poster presentations: Reinforcement of poly (methyl methacrylate) by WS_2 nanotubes towards antiballistic applications
(S. Ghosh, G. Otorgust, O. Regev, D.Y. Lewitus, A. Zak)
Control of exciton-polariton interactions in nano regime: Prediction of nanotube diameter
(S.S. Sinha, R. Rosentsveig, A. Zak, I. Pinkas, R. Tenne, L. Yadgarov)

3/2018 BIT's 4th Annual World Congress of SmartMaterials-2018, Osaka, Japan, 6-8 March 2018
Oral presentation: Inorganic NanoTubes (INT) of MoS_2 and WS_2: Their synthesis, properties and applications
(C. Pallellappa, A. Idelevich, L. Rovinsky, V. Brueser, A. Zak)

10-11/2016 24th International Conference on the Application of Accelerators in Research and Industry (CAARI 2016), Fort Worth, Texas, USA, 30 October-4 November 2016
Oral presentation: INT-WS_2 Niobium implantation studies
(M. Straticiuc, A. Zak, M. Nistor, E. Matei, M. Manea, I. Burducea, F. Gherendi, P. Dinca)

10/2016 2nd Israel-Greece Joint Meeting on Nanotechnology and BioNanoscience, Heraklion, Crete, Greece, 25-28 October 2016
Poster presentations:
1. Reproducible synthesis of MoS2 nanotubes with controllable aspect ratio via sulfidization of preliminary grown MoO3-x nanowhiskers
(C. Pallelappa, A. Zak)
2. Raman scattering from single WS_2 nanotubes embedded within stretched PVDF nanofibers
(O. Grinberg, R. Avrahami, E. Zussman, T. Livneh, A. Zak)

10/2015 8th International Workshop on Infrared Microscopy and Spectroscopy Using Accelerator Based Sources (WIRMS 2015), Riverhead, Long Island, New York, USA, 11-15 October 2015
Oral presentation: Revealing the pressure-induced breakdown pathway in WS_2 nanotubes
(K.R. O'Neal, J.G. Cherian, A. Zak, R. Tenne, Z. Liu, J. Musfeldt)

9/2014 The 1st Whole Action Meeting (WAM 2014) EUSpec COST Action MP1306: Modern Tools for Spectroscopy on Advanced Materials, Louvain-la-Neuve, Belgium, 15-17 September 2014
Oral presentation: Inorganic nanotubes and fullerene-like nanoparticles of WS_2, their synthesis, properties and applications

12/2013 2013 MRS – Materials Research Society Fall Meeting and Exhibit, Boston, MA, USA, 1-6 December 2013
Poster presentation: Inorganic (WS_2 fullerene-like nanoparticles and multiwall nanotubes and their application in novel polymer nanocomposites
(A. Zak, R. Tenne, L. Rapoport, E. Zussman)

10/2013 COINAPO Consortium - Composites of Inorganic Nanotubes and Polymers, (Cost Action MP0902) Nanoparticle-Polymer Composites Topical Meeting, Crete, Greece, 14-16 October 2013
Oral presentation: Novel poly(3-hydroxybutyrate) nanocomposites containing WSW_2 inorganic nanotubes with improved thermal, mechanical and tribological properties
(M. Naffakh, C. Marco, G. Ellis, S.R. Cohen, A. Laikhtman, L. Rapoport, A. Zak)

6. Participation in Scholarly Conferences, contd.

f. Oral and Poster Presentations Abroad

9/2012 The Sixth International Association for Dental Research Pan-European Region Meeting (IADR/PER), Helsinki, Finland, 12-15 September 2012
Oral presentation Biocompatibility examination of inorganic nanotubes on A5 salivary gland cells
(A. Zak, R. Tenne, E. Kartvelishvily, Y. Neuman, A. Palmon, A. Hovav, D. Aframian)

4/2012 COINAPO Consortium – 5th Composites of Inorganic Nanotubes and Polymers, Cost Action MP0902, Workshop and Management Committee Meeting, Prague, Czech Republic, 17-20 April 2012
Oral presentation: Tribological properties of epoxy resin composite with inorganic WS_2 nanoparticles

12/2011 COINAPO Consortium – 4th Composites of Inorganic Nanotubes and Polymers, Cost Action MP0902), Ljubljana, Slovenia, 8-9 December 2011
Oral presentation: WS_2 nanotubes embedded in PMMA nanofibers as energy absorptive material

9/2011 ChinaNANO 2011 – International Conference on Nanoscience and Technology, Beijing, China, 7-9 September 2011
Poster presentations:
1. Large-scale synthesis of WS_2 multiwall nanotubes
2. The effect of fullerene-like tungsten disulfide and carbon nanotubes on the mechanical properties of epoxy adhesives
3. The mechanical and tribological properties of epoxy nanocomposites with WS_2 nanotubes

3/2011 COINAPO Consortium – 3rd Composites of Inorganic Nanotubes and Polymers Topical Meeting: Inorganic Nanomaterials and Their Composites: From Fabrication to Applications, Cost Action MP0902, Sestriere, Italy, 2-3 March 2011
Oral presentation: The effect of WS_2 nanotubes on the properties of epoxy-based nanocomposites

4/2010 AddNano – EU-FP7, Turin, Italy
Oral presentation: Inorganic nanotubes and fullerene-like particles from 2D layered compounds: State of the Art

10/2009 TMCN9 – Transition Metal Chalcogenide and Halide Nanoparticles, Catania, Italy
Oral presentation: Insight into the growth mechanism of WS_2 nanotubes in the scaled-up fluidized bed reactor

g. Seminars in Israel

3/2017 Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa, Israel, 23 March 2017
Oral presentation: Inorganic nanotubes of MoS_2 and WS_2, their synthesis, characterization and applications – The update

6/2015 The Electrochemistry and Material Science Seminar, Tel-Aviv University, Tel-Aviv, Israel, 10 June 2015
Oral presentation: Single wall and multiwall nanotubes of WS_2, their synthesis and wide range of applications – From mechanical enhancement of polymers to hydrogen storage and optical devices [invited]

7/2011 Seminar for R&D Department, Rafael, Israel
Oral presentation Inorganic fullerene-like nanoparticles (IF) and nanotubes (INT) for composite applications

6. Participation in Scholarly Conferences, contd.

g. Seminars in Israel

6/2011 Seminar for students, Ben Gurion University, Beer-Sheva, Israel
Oral presentation: Industrial synthesis of inorganic WS_2 fullerene-like (IF) nanoparticles and inorganic WS_2 nanotubes (INT) and their applications

h. Seminars Abroad

5/2023 Meeting of joint project funded by NATO in the framework of the Science for Peace and Security (SPS) Programme, University of Rome Tor Vergata, Rome, Italy, 3 May 2023

9/2011 Seminar for students – Peking University (Beijing), Nankai University (Tianjin), China
Oral presentation: Industrial synthesis of inorganic WS_2 fullerene-like (IF) nanoparticles and inorganic WS_2 nanotubes (INT) and their applications

9/2008 Seminar for students, University of Kishinev, Moldova
Oral presentation: Inorganic fullerene-like (IF) nanoparticles and nanotubes (NT) from 2-D layered compounds

7. Invited Guest Lectures in Israel

Date	Place of Lecture	Name of Forum	Presentation/Comments
2/3/2023	IVS-IPSTA 2023 – 40th Annual Conference of the Israel Vacuum Society		Invited Lecture: WS_2 and MoS_2 from 3D to 1D structures: Curvature and chirality induced properties of nanotubes
19/1/2020	Holon Physics Seminar, HIT – Holon Institute of Technology, Holon, Israel		Invited Lecture: Super WS_2 and MoS_2 nanotubes: From strengthening polymers to harvesting energy
25-27/11/2019	First Israel-Italy Workshop on 2D Materials, Bar-Ilan University, Ramat Gan, Israel		Invited Lecture: Super WS_2 and MoS_2 nanotubes – From strengthening polymers to harvesting energy
14-17/1/2019	Winter School on 2D Materials, Weizmann Institute of Science, Rehovot, Israel		Invited Lecture: 2D transition metal dichalcogenides: Synthesis and energy conversion applications
10/6/2015	The Electrochemistry and Material Science Seminar, Tel-Aviv University, Tel-Aviv, Israel		Invited Lecture: Single wall and multiwall nanotubes of WS_2, their synthesis and wide range of applications – From mechanical enhancement of polymers to hydrogen storage and optical devices

7. Invited Guest Lectures in Israel, contd.

Date	Place of Lecture	Name of Forum	Presentation/Comments
4/2/2013	8th International Conference Applications of Nanotechnology for the Plastics Industry, Shenkar College of Engineering, Ramat Gan, Israel		Invited Lecture: Friction and wear properties of nanocomposites based on tungsten sulfide
7/2/2011	6th International Conference Nano-technology for the Plastics and Rubber Industries, Shenkar College, Israel		Invited Lecture: The effect of inorganic WS_2/MoS_2 fullerene-like nanoparticles and nanotubes on polymer properties
8-9/11/2010	NanoIsrael-10 Conference, Tel-Aviv, Israel		Invited Lecture: Presentation of the company achievements

7. Invited Guest Lectures Abroad

Date	Place of Lecture	Name of Forum	Presentation/Comments
22-25/10/2023	IEEE Nanotechnology Materials and Devices Conference (NMDC 2023), Paestum, Salerno, Italy		Invited Keynote Speaker
27-30/8/2023	International Conference on Functional Nanomaterials and Nano Devices (NANOMAT 2023), Warsaw, Poland		Invited Keynote Speaker: WS_2 and MoS_2 nanotubes for Hydrogen evolution reaction and Artificial Intelligence
26-30/3/2023	ACS Spring 2023 - Crossroads of Chemistry: ACS Award in the Chemistry of Materials: Symposium in Honor of Prof. Reshef Tenne, Indianapolis, US		Invited lecture: WS_2 and MoS_2 from 3D to 1D structures: Curvature and chirality induced properties of nanotubes
9-13/1/2023	5th HeteroNanoCarb-2023: Advances and Applications in Carbon Related Nanomaterials: From Pure to Doped Structures including Heteroatom Layers, Benasque (Aragon), Spain		Invited lecture: WS_2 and MoS_2 from 3D to 1D structures: Curvature and chirality induced properties of nanotubes (S. Ghosh, C. Pallellappa, Y. Zhang, Y. Iwasa, A. Di Bartolomeo, I. Kaplan-Ashiri, V. Bruser, Y. Gao, A. Zak)

7. Invited Guest Lectures Abroad, contd.

Date	Place of Lecture	Name of Forum	Presentation/Comments
1-16/9/2022	IEEE 12th International Conference "Nanomaterials: Applications & Properties" (IEEE NAP-2022), Kraków, Poland		Invited Lecture: WS_2 and MoS_2 from 2D to 1D structures: Curvature and chirality induced properties of nanotubes
5-7/9/2022	International Conference on Functional Nanomaterials and Nanodevices (NANOMAT 2022), Bratislava, Slovakia		Organizer to give a talk Invited Lecture: WS_2 and MoS_2 from 3D to 1D structures: Curvature and chirality induced properties of nanotubes
20-29/6/2022	15th International Conference on Modern Materials and Technologies (CIMTEC 2022): 15th International Ceramics Congress (20-24 June) Montecatini Terme, Italy	9th Forum on New Materials (25-29 June)	Invited Lecture: Synthetic route towards pure phase of WS_2 and MoS_2 inorganic nanotubes and their unusual properties (Symposium F1: Graphene and Other Emerging 2D-layered Nanomaterials: Synthesis, Properties and Potential Applications);
13-15/9/2021	International Meet & Expo on Nanotechnology – NANOMEET 2021, Porto, Portugal		Invited Lecture: Synthetic route towards pure phase of WS_2 and MoS_2 inorganic nanotubes and their unusual properties (online)
6-8/9/2021 (postponed to 2022)	International Online Conference on Functional Nanomaterials - 2021 Nanotechnology Conference, Bratislava, Slovakia		Invited Lecture: Super WS_2 and MoS_2 nanotubes – From strengthening of polymers to piezoresistive effect and bandgap engineering
30-31/10/2021 (postponed)	5th International Conference NANOCON 2020, Pune, India		Invited Keynote Speaker
21-29/9/2020 (postponed)	CIMTEC 2020, Montecatini Terme, Italy	9th Forum on New Materials	Invited Lecture: Synthetic route toward pure phase of WS_2 and MoS_2 inorganic nanotubes (INT) and their unusual properties
18-20/8/2021 (postponed)	International Conference Advances in Functional Materials – AAAFM-UCLA, University of California Los Angeles, CA, USA		Invited Speaker

7. Invited Guest Lectures Abroad, contd.

Date	Place of Lecture	Name of Forum	Presentation/Comments
27-30/4/2020 (postponed)	2nd European Conference on Novel Photonic, Optoelectronic and Electronic Materials (SPb-POEM), St. Petersburg, Russia		Invited Lecture
11-13/9/2019	NANOMAT 2019: International Conference on Functional Nanomaterials and Nanodevices, Prague, Czech Republic		Invited Lecture: Advance in properties study and synthesis approaches of MoS_2 and WS_2 inorganic nanotubes
2-6/9/2019	7th International Conference Flatlands Beyond Graphene, Toulouse, France		Invited Lecture: An update on properties and synthesis of MoS_2 and WS_2 nanotubes
4-8/6/2019	International Conference Nano-M&D 2019: Properties, Fabrication and Applications of Nano-Materials and Nano-Devices, Paestum, Italy		Invited Lecture: Advances in properties and synthesis of MoS_2 and WS_2 nanotubes
25-26/10/2018	4th International Conference - NANOCON 18: "Nanotechnology-Applications, Advances and Innovations", Pune, India		Keynote Lecture: From multi- to single wall inorganic nanotubes of WS_2 and MoS_2, their synthesis and properties in: Raman scattering under tensile and pressure, composites, photovoltaic effect and hydrogen storage
3-5/9/2018	International Conference on Functional Nanomaterials and Nanodevices, Vienna, Austria		Invited Lecture: Single wall and multiwall WS_2 Inorganic NanoTubes (INT) , their synthesis, properties and applications
11-15/6/2018	EMN Meeting on Nanowires 2018, Prague, Czech Republic		Invited Lecture: Synthesis, properties and applications of inorganic nanotubes of MoS_2 and WS_2
6-10/10/2017	Uzbek-Israel Scientific Conference "Contemporary Problems in Mathematics and Physics, Tashkent, Uzbekistan		Invited Lecture: Inorganic nanotubes of MoS_2 and WS_2: their synthesis, properties and applications

7. Invited Guest Lectures Abroad, contd.

Date	Place of Lecture	Name of Forum	Presentation/Comments
7-8/9/2017	11th International Conference on Advanced Materials & Processing, Edinburgh, Scotland		Keynote Lecture: Single wall and multiwall WS_2 nanotubes synthesis and characterization – The update
25-28/10/2016	2nd Israel-Greece Joint Meeting in Nanotechnology and BioNanoscience, Heraklion, Crete		Invited Lecture: Single wall and multiwall WS_2 nanotubes synthesis and characterization – The update
15-19/6/2015	Telluride Science Workshop "Enhanced Functionalities in 4- and 5*d*-containing Materials from Large Spin-Orbit Coupling", Colorado, USA		Invited Lecture: Single- and multi-wall WS_2 nanotubes: their synthesis and optoelectronic properties
3-6/7/2013	Laserion 2013 International Workshop on "Microfabrication, Nanostructured Materials and Biotechnology", Munich, Germany		Invited Lecture: Scaled-up synthesis of pure phase multiwall WS_2 nanotubes; their properties for photovoltaic and nanocomposite applications
8-11/4/2013	EMN – Energy Materials Technology Spring Meeting, Orlando, USA		Invited Lecture: High temperature synthesis of inorganic (WS_2/MoS_2) fullerene-like nanoparticles and nanotubes
1-5/4/2013	2013 MRS – Materials Research Society Spring Meeting and Exhibit, San Francisco, CA, USA		Invited Lecture: Beyond graphene and carbon nanotubes: 2D systems from atomic layered materials
18-19/10/2012	"Nanocon 012" – 2nd International Conference – Nanotechnology: Innovative Materials, Processes Products and Applications, Pune, India		Invited Lecture: Scaled up synthesis of pure phase WS_2 multiwall nanotubes and their applications
2-7/9/2012	ASON 2 – 2nd Adriatic School of Nanoscience, Dubrovnik, Croatia		Invited Lecture: Synthesis of pure phase WS_2 multiwall nanotubes and their influence on polymer properties

Invited to give a talk at the 4th Annual World Congress of Nano Science & Technology (Nano-S&T) held in Qingdao, China, 29-31 October 2014. Due to technical reasons, Dr. Zak was unable to attend.

8. Research Grants

a. Grants Awarded

Year	Funded by/ Amount	Topic	Co-Researchers	Role in Research
6/2022	HIT – Holon Institute of Technology; Ariel University; Kaplan Medical Center, Israel/ 350,000 NIS for one year	Scientific Booster grant: Scalable, catalyst-free method for the production of MoS_2 and WS_2 nanotubes using an innovative porous-quartz reaction cell	Personal	Principal Investigator
6/2022	HIT – Holon Institute of Technology; Ariel University; Kaplan Medical Center, Israel/ 350,000 NIS for one year	Scientific Booster grant: Development of novel nanocomposite of semiconductor nanostructures for highly efficient solar energy conversion via solar cells, in collaboration with	Dr. Lena Yadgarov, Ariel University	Co-Principal Investigator
2022	Ariel University, Ariel, Israel; HIT – Holon Institute of Technology, Holon, Israel/ 35,000 NIS for one year	Joint cooperation: Development of novel hybrid semiconductor nanostructures for highly efficient solar energy conversion	Dr. Lena Yadgarov, Ariel University	Co-Principal Investigator
2022	Science for Peace and Security (SPS) Programme, NATO, Brussels, Belgium/ €273,000 overall project budget	Research grant project SPS G5936: Ultralight wearabl**E** **S**olar **C**ells **As** a **P**ortable **E**lectricity source **(ESCAPE)**	In collaboration with Director: • Dr. Luca Camilli, University of Rome Tor Vergata, Rome, Italy Co-directors: • **Prof. Alla Zak**, HIT, Holon, Israel • Prof. Maurizio Passacantando, University of L'Aquila, Coppito, Italy • Prof. Antonio Di Bartolomeo, University of Salermo, Fisciano, Italy • Dr. Filippo Giubileo, National Research Council, Fisciano, Italy	

8. Research Grants, contd.

a. Grants Awarded

Year	Funded by/ Amount	Topic	Co-Researchers	Role in Research
1/1-31/12/2019	Ariel University, Ariel, Israel; and HIT – Holon Institute of Technology, Holon, Israel/40,000 NIS for one year	Joint cooperation: Al alloys reinforcement by inorganic nanotubes (RA 1900000523)	Dr. Konstantin Borodianskiy, Ariel University	Co-Principal Investigator
10/2016-9/2020	Israel Science Foundation/ 360,000 NIS per year - for four years	Single wall nanotubes of WS_2, their synthesis and properties towards optoelectronics and hydrogen storage	Personal	Principal Investigator
2015-2018	Pazy Foundation/ 1120 KNIS for four years	Nanocomposite ballistic armor made of inorganic WS_2 nanotubes and fullerene-like nanoparticles in polymethyl methacrylate	Dr. Omri Regev, Rafael Advanced Defense Systems Ltd.	Principal Investigator
2-11/9/2015	Laboratory of the Norway/ 2100 EUR	Short term scientific mission approved by European Cooperation in Science and Technology: COST Action MP1306 – Modern tools for spectroscopy on advanced materials	Collaborator: Prof. Sabrina Sartori, Oslo University, Oslo, Norway/	Co-Principal Investigator
2014-2017	Israel Ministry of Science, Technology and Space, Israel/ 970,876 NIS for three years	IF/INT polymer nanocomposites for tribological extreme applications	Prof. Lev Rapoport, HIT; Prof. Shmuel Kenig, Shenkar College	Co-Principal Investigator
2014	COST – Action No. MP1306	Modern tools for spectroscopy on advanced materials (EUSpec)	Up to 20 participants	Management Committee Representative
2012-2016	Israel National Nano-Initiative (INNI) – A Focal Technology Area (FTA) program of the Israel Council for Higher Education (Malag)/ $354,365 for four years	Inorganic nanotubes (INT): From nano-mechanics to improved nanocomposites	10 participants	Co-Principal Investigator

8. Research Grants, contd.

a. Grants Awarded

Year	Funded by/ Amount	Topic	Co-Researchers	Role in Research
2012-2016	Pazy Foundation - Israel Atomic Energy Commission (IAEC) and Israel Council for Higher Education (Malag)/ 740,000 NIS for four years	Reinforcing aerogel with inorganic nanoparticles and nanotubes	Prof. Reshef Tenne, WIS; Dr. Galit Bar and Raz Gvishi, Soreq	Researcher
2012-2014	Israel-Korea Scientific Research Cooperation/ 200,000 NIS for two years	Inorganic fullerenes and inorganic nanotubes for hydrogen storage as source of renewable energy in fuels	Dr. Alex Laikhtman, HIT; Dr. Hoi Ri, Ulsan National Institute of Science and Technology, Korea	Co-Principal Investigator
2009-2013	COST Action MP0902 IL	Composites of inorganic nanotubes and polymers (COINAPO)	26 participants	Management Committee Substitute Member

8. Research Grants

b. Submission of Research Proposals - Pending

Year	Funded by/ Amount	Topic	Co-Researchers	Role in Research
2021	European Commission – Horizon Europe Framework Program (HORIZON)	ETERNAL - n**E**uroin**TE**g**R**ated e**N**do-**A**rtificial b**L**adder	• Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy • University College, London, UK • KU Leuven, Belgium • Institut Mines-Telecom, France • HIT – Holon Institute of Technology, Israel • Ago Neuro-technologies Sarl, Chile	

9. Scholarships, Awards and Prizes

2016/2017	HIT, Israel - Excellence in research
2014	Institution of Civil Engineers, London, UK - Awarded the 'Best Science Paper Award' for the paper entitled: Photocatalysis with hybrid co-coated WS_2 nanotubes (Y. Tsverin, T. Livneh, R. Rosentsveig, A. Zak, I. Pinkas, R. Tenne), Nanomaterials and Energy, 2(1), 2013 (25-34). The ceremony took place in London, UK, 17/10/2014
2013/2014	HIT, Israel - Excellence in research/creativity, teaching, and contribution to the community
2012/2013	HIT, Israel - Excellence in research and creativity
2010	German Federal Ministry for Economics and Technology - Automotive Excellence Innovation Competition Top 30 Award 2010 given to NanoMaterials Ltd.
2010	NanoIsrael-10, Ministry of Industry & Trade – Nanotechnology Company of the Year Award 2010
2000	Israel Vacuum Society Meeting – Best poster award

10. Teaching

a. Courses Taught in Recent Years

Year	Name of Course	Type of Course Lecture/Seminar/ Workshop/High Learn Course/ Introduction Course (Mandatory)	Degree	Number of Students
2016-2022	Nanomaterials	Lecture	M.Sc.	
2012-2022	Physics I	Lecture	B.Sc.	
2012-2022	Physics I	Laboratory	B.Sc.	

b. Supervision of Graduate Students

Post-Doctoral Students

Name of Student	Title of Topic	Degree	Date of Completion/ in Progress	Students' Achievements
Manjunath Krishnappa☸	Synthesis of inorganic nanomaterials and study of their catalytic properties	Post-Doc	31/3/2023	

☸ under the supervision of Prof. Alla Zak (HIT) and Prof. Maya Bar-Sadan (Ben-Gurion University)

b. Supervision of Graduate Students, contd.

Post-Doctoral Students

Name of Student	Title of Topic	Degree	Date of Completion/ in Progress	Students' Achievements
Ghosh Saptarshi	Synthesis of inorganic nanoparticles and their characterization	Post-Doc	31/12/2021	5 publications
Chithaiah Pallellappa	Synthesis of inorganic nanoparticles and their characterization	Post-Doc	1/2017	2 publications
Olga Grinberg	Nanomaterials	Post-Doc	11/2016	1 publication
Efrat Ohayon	Synthesis of inorganic nanoparticles, their characterization and applications	Post-Doc	1/2014 – six month duration)	

11. Miscellaneous

a. Membership in Professional Societies

2013 Israel Vacuum Society

2023-present The Israel Chemical Society (ICS)

b. Interests

- Nanoparticles and nanotubes, nanotechnology
- Synthesis of nanomaterials in laboratory and industrial levels
- Characterization and investigation of nanomaterials
- Dispersion of nanoparticles/nanotubes
- Preparation of polymer nanocomposites: Bulk and coatings
- Properties of polymer composites with nanostructures
- Optical, electrical and catalytic behavior of nanotubes

12. Professional Experience

2002-2011 Chief Scientist – NanoMaterials Ltd., Israel

1991-1996 Physics Teacher – Scientific high schools in Israel

1985-1990 Technology Engineer – Electrical Device Engineering Institute of Science, Kishinev, Moldova

PUBLICATIONS

A. Ph.D. Dissertation

"Synthesis and properties of pristine and alkali metal intercalated MoS_2/WS_2 fullerene-like nanoparticles", 2002 (82 pages) in English, Faculty of Chemistry, Department of Materials and Interfaces, Weizmann Institute of Science, Israel, Supervisors: Prof. R. Tenne; Prof. S. Reich

D. Articles in Refereed Journals

Published

1. A. Pelella, A. Kumar, K. Intonti, O. Durante, S. De Stefano, X. Han, Z. Li, Y. Guo, F. Giubileo, L. Camilli, M. Passacantando, **A. Zak**, A. Di Bartolomeo
WS_2 nanotube transistor for photodetection and optoelectronic memory applications
Small 2024, 2403965
WoS: Q1, IF: 13.5 (2023)

*2. S.R. Kadam, M. Krishnappa, S. Ghosh, M.B. Sreedhara, A. Neyman, A. Upcher, E. Nativ Roth, L. Houben, **A. Zak**, A.N. Enyashin, R. Bar-Ziv, M. Bar-Sadan (2024)
Nanotubes and other nanostructures of VS_2, WS_2 and MoS_2: Structural effects on the hydrogen evolution reaction
Applied Materials Today, 39 (Article No.102288)
published online 15 June 2024
WoS: Q1, IF: 7.8 (2023)

*3. V. Kundrát, L. Novák, K. Bukvišová, J. Zálešák, E. Kolíbalová, R. Rosentsveig, M.B. Sreedhara, H. Shalom, L. Yadgarov, **A. Zak**, M. Kolíbal, R. Tenne (2024)
Mechanism of WS_2 nanotube formation revealed by *in Situ/ex Situ* imaging
ACS Nano, 18(19), May 2024 (12284-12294)
WoS: Q1, IF: 16.2 (2023)

*4. S. Dey, A. Roy, S.B. Mujib, M. Krishnappa, **A. Zak**, G. Singh (2024)
Addressing irreversibility and structural distortion in WS_2 inorganic fullerene-like nanoparticles: Effects of voltage cut-off experiments in beyond Li+-ion storage applications
ACS Omega, 9(15), April 2024 (17125-17136)
WoS: Q2, IF: 4.0 (2022)

*5. J.I. Martinez, A. Laikhtman, **A. Zak**, M. Sezen, J.A. Alonso (2024)
Implantation of Gallium into layered WS_2 nanostructures facilitated by hydrogenation
Small, first published 3 March 2024 (2312235-1–2312235-10)
https://doi.org/10.1002/smll.202312235
WoS: Q1, IF: 13.2 (2022)

*6. E. Magee, F. Xie, S. Farris, A. Dsouza, C. Constantinidou, **A. Zak**, R. Tenne, T. McNally (2023)
Polyelectrolyte complexation of Chitosan and WS_2 nanotubes
Advanced Materials Interfaces, 11(6), December 2023 (2300501-1–2300501-15)
WoS: Q2, IF: 5.7 (2022)

*7. P.N. Immanuel, S-J Hiang, P. Taank, A. Goldreich, J. Prilusky, A. Byregowda, R. Carmieli, H. Shalom, A. Leybovich, **A. Zak**, N. Aggarwal, K.V. Adarsh, L. Yadgarov (2023)
Enhanced photocatalytic activity of Cs_4PbBr_6/WS_2 hybrid nanocomposite
Advanced Energy and Sustainability Research, 5(2), December 2023 (2300193-1–2300193-11)
WoS: Q2 (JCI), IF: 5.8 (2022)

*Since last promotion
2021 Five-year Impact Factor unless otherwise stated

D. Articles in Refereed Journals, contd.

Published

*8. A. Dutta, O. Breuer, M. Krishnappa, R. Minnes, **A. Zak**, A. Borenstein (2023)
1D transition-metal dichalcogenides/carbon core-shell composites for the hydrogen evolution reaction
J. of Materials Chemistry A, 11(4), September 2023 (21806-21816)
WoS: Q1, IF: 11.6 (2022)

*9. Y. Niu, L. Li, Z. Qi, H.H. Aung, X. Han, R. Tenne, Y. Yao, **A. Zak**, Y. Guo (2023)
OD van der Waals interfacial ferroelectricity
Nature Communications, 14, March 2023 (5578)
WoS: Q1, IF: 17.0 (2022)
https://doi.org/10.1038/s41467-023-41045-8
Research highlights in Nature Electronics (IF: 34.4), Vol.6, November 2023 (p.793) on this paper

*10. E. Magee, F. Tang, M. Walker, **A. Zak**, R. Tenne, T. McNally (2023)
Silane functionalization of WS_2 nanotubes for interaction with poly(lactic acid)
Nanoscale, 15, March 2023 (7577-7590)
WoS: Q1, IF: 7.891 (2023)

*11. S. Dey, K. Manjunath, **A. Zak**, G. Singh (2023)
WS_2 nanotube-embedded SiOC fibermat electrode for sodium-ion batteries
ACS Omega, 8, March 2023 (10126-10138)
WoS: Q2, IF: 4.132

*12. S. Wei, M. Serra, S. Mourdikoudis, H. Zou, B. Wu, L. Děkanovsky, J. Sturala, J. Luxa, R. Tenne, **A. Zak**, Z. Sofer (2022)
Improved electrochemical performance of NTs-WS_2@C nanocomposites for lithium-ion and sodium-ion batteries
ACS Applied Materials and Interfaces, 14, October 2022 (46386-46400)
WoS: Q1, IF: 10.382, JCR citations: 5

*13. Y. Sun, S. Xu, Z. Xu, J. Tian, M. Bai, Z. Qi, Y. Niu, H.H. Aung, X. Xiong, J. Han, C. Lu, J. Yin, S. Wang, Q. Chen, R. Tenne, **A. Zak**, Y. Guo (2022)
Mesoscopic sliding ferroelectricity enabled photovoltaic random access memory for material-level artificial vision system
Nature Communications, 13(1), September 2022, Article No.5391 (1-8)
published online 14 September 2022
https://doi.org/10.1038/s41467-022-33118-x
WoS: Q1, IF: 17.763, JCR citations: 4

*14. M.B. Sreedhara, S.S. Sinha, **A. Zak**, L. Yadgarov, R. Tenne (2022)
Review: Nanotubes and fullerene-like nanoparticles from layered transition metal dichalcogenides: Why do they form and what is their significance?
Zeitschrift fűr anorganische und allgemeine Chemie (ZAAC) - J. of Inorganic and General Chemistry 648(15), May 2022 (e202200128-1–e202200128-10)
Special issue dedicated to Prof. Mercouri Kanatzidis on the occasion of his 65th birthday
https://doi.org/10.1002/zaac.202200128
WoS: Q4, IF: 1,268, JCR citation: 1

*15. E. Magee, F. Tang, E. Ozdemir, M. Walker, T. Di Luccio, J.A. Kornfield, **A. Zak**, R. Tenne, T. McNally (2022)
WS_2 nanotubes as a 1D functional filler for melt mixing with poly(lactic acid): Implications for composites manufacture
ACS Applied Nano Materials, 5, May 2022 (6385-6397)
WoS: Q2, IF: 6.104, JCR citations: 2

*Since last promotion

D. Articles in Refereed Journals, contd.

Published

16. L. Yue, D. Xu, Z. Wei, T. Zhao, T. Lin, R. Tenne, **A. Zak**, Q. Li, B. Liu (2022)
Size and shape's effects on the high-pressure behavior of WS_2 nanomaterials
Materials, 15(8), April 2022 (2838)
Part of the special issue: Advances in Structural Phase Transition and Physical Properties of Nanomaterials under High Pressure
WoS: Q2, IF: 4.042, JCR citations: 2

17. N. Kamanina, A. Toikka, Y Barnash, **A. Zak**, R. Tenne (2022)
Influence of surface relief on orientation of Nematic liquid crystals:
Polyimide doped with WS_2 nanotubes
Crystals, 12(3), March 2022 (391)
WoS: Q2, IF: 2.688, JCR citations: 3

18. O. Golan, H. Shalom, I. Kaplan-Ashiri, S.R. Cohen, Y. Feldman, I. Pinkas, R.O. Almog, **A. Zak**, R. Tenne (2021)
Poly(L-lactic acid) reinforced with hydroxyapatite and tungsten disulfide nanotubes
Polymers, 13(21), 8 November 2021 (3851)
https://doi.org/10.3390/polym13213851
WoS: Q1, IF: 5.063, JCR citation: 1

19. H. Xia, X. Chen, ,S. Luo, F. Qin, A. Idelevich, S. Ghosh, T. Ideue, Y. Iwasa, **A. Zak**, R. Tenne, Z. Chen, W-T Liu, S. Wu (2021)
Probing the chiral domains and excitonic states in individual WS_2 tubes by second harmonic generation
Nano Letters, , 21(12), 11 June 2021 (4937-4943)
https://doi.org/10.1021/acs.nanolett.1c00497
WoS: Q1, IF: 12.709, JCR citations: 7

20. L. Rocher, A.S. Ylitalo, T. Di Luccio, R. Miscioscia, G. De Filippo, G. Pandolfi, F. Villani, **A. Zak**, G.H. Menary, A.B. Lennon, J.A. Kornfield (2021)
Interaction of poly L-Lactide and tungsten disulfide nanotubes studied by in situ X-ray scattering during expansion of PLLA/WS_2NT nanocomposite tubes
Polymers, 13(11), 27 May 2021 (1764-1—1764-19)
https://doi.org/10.3390/polym13111764
WoS: Q1, IF: 5.063, JCR citations: 4

21. S. Ghosh, G. Otorgust, A. Idelevich, O. Regev, I. Lapsker, D.Y. Lewitus, **A. Zak** (2021)
Reinforcement of poly (methyl methacrylate) by WS_2 nanotubes towards antiballistic applications
Composites Science and Technology, 207❶, 3 May 2021 (108736)
https://doi.org/10.1016/j.compscitech.2021.108736
WoS: Q1, IF: 8.788, JCR citations: 8

22. S.S. Sinha, L. Yadgarov, S.B. Aliev, Y. Feldman, I. Pinkas, C. Pallellappa, S. Ghosh, A. Idelevich, **A. Zak**, R. Tenne (2021)
MoS_2 and WS_2 nanotubes: Synthesis, structural elucidation and optical characterization
The J. of Physical Chemistry C: Energy, Materials & Catalysis,
Section C: Physical Properties of Materials & Interfaces
Published 11 March 2021, 125, (6324-6340)
WoS: Q2, IF: 4.480, JCR citations: 13

❶ This issue is in progress but contains articles that are final and fully citable

D. Articles in Refereed Journals, contd.

Published

23. D. Binwal, K. Pramoda, **A. Zak**, M. Kaur, C. Pallellappa, C.N.R. Rao (2021)
Nanocomposites of 1D MoS_2 with polymer-functionalized nanotubes of carbon and borocarbonitride, and their HER activity
ACS Applied Energy Materials, 4(3), (2339-2347)
published 8 February 2021
https://doi.org/10.1021/acsaem.0c02874
WoS: Q1, IF: 7.010, JCR citations: 13

24. A.K. Sonker, S. Roy, H.D. Wagner, **A. Zak**, X.M. Sui, R. Bajpai (2020)
Synergistic effect of crosslinking and dual reinforcement on the thermal and mechanical properties of polyvinyl alcohol
Polymer Composites, December 2020 (1-10)
https://doi.org/10.1002/pc.25894
WoS: Q2, IF: 2.980, JCR citations: 2

25. H. Shalom, T. Bendikov, Y. Feldman, N. Lachman, **A. Zak**, R. Tenne (2020)
Chemical control of the surface of WS_2 nanoparticles
Chemical Physics Letters, 761, December 2020 (138052)
WoS: Q3, IF: 2.255, JCR citations: 2

26. N.V. Kamanina, Yu. A. Zubtcova, P.V. Kuzhakov, **A. Zak**, R. Tenne (2020)
Correlations between spectral, time and orientation parameters of liquid crystal cells with WS_2 nanoparticles
Liquid Crystals and Their Application (Russian Journal), 20(3), (41-48)
WoS: Q4, JCI: 0.27

27. S. Ghosh, V. Brüser, I. Kaplan-Ashiri, R. Popovitz-Biro, S. Peglow, J.I. Martínez, J.A. Alonso, **A. Zak** (2020)
Cathodoluminescence in single and multiwall WS_2 nanotubes: Evidence from quantum confinement and strain effect
Applied Physics Reviews, 7(4), October 2020 (041401) (published online 21 October 2020)
WoS: Q1, IF: 20.560, JCR citations: 10
[Chosen as a Featured Article. It will be displayed prominently on the journal's homepage; Also selected as Scilight❷ under the title "Tungsten disulfide nanotubes demonstrate useful luminescent behavior" written by Mara Johnson-Groh https://doi.org/10.1063/10.0002409; DOI: 10.1063/10.0002409]

28. A. Grillo, M. Passacantando, **A. Zak**, A. Pelella, A. Di Bartolomeo (2020)
WS_2 nanotubes: Electrical conduction and field emission under electron irradiation and mechanical stress
Small, August 2020 (2002880-1—2002880-9)
WoS: Q1, IF: 14.257, JCR citations: 25

29. N.V. Kamanina, Yu. A. Zubtsova. A.S. Toikka, S.V. Likhomanova, **A. Zak**, R. Tenne (2020)
Temporal characteristics of liquid crystal cell with WS_2 nanoparticles: Mesophase sensitization and relief features
Liquid Crystals and Their Application (Russian Journal), 20(1), March 2020 (34-40)
WoS: Q4, JCI: 0.27, JCR citations: 9

30. C. Pallellappa, S. Ghosh, A. Idelevich, L. Rovinsky, T. Livneh, **A. Zak** (2020)
Solving the "MoS_2 nanotubes" synthetic enigma and elucidating the route for their catalyst-free and scalable production
ACS Nano, 14(3), February 2020 (3004-3016)
WoS: Q1, IF: 18.022, JCR citations: 41

❷ A science highlight briefly summarizes newly published research, emphasizing its significance to a particular field.

D. Articles in Refereed Journals, contd.

Published

31. S.S. Sinha, **A. Zak**, R. Rosentsveig, J. Pinkas, R. Tenne, L. Yadgarov (2020)
Size-dependent control of exciton-polariton interactions in WS_2 nanotubes
Small, 16(4), January 2020 (1904390-1–1904390-10)
[appears inside back cover]
WoS: Q1, IF: 14.257, JCR citations: 17

32. P. Bertasius, M. Shneider, J. Macutkevic, V. Samulionis, J. Banys, **A. Zak** (2019)
Dielectric properties of epoxy-matrix composites with tungsten disulfide nanotubes
J. of Nanomaterials, Special Issue: Synthesis, Characterization, and Applications of Polymer Nanocomposites, Volume August 2019, Article ID 5761439 (8 pages)
WoS: Q3, IF: 3.499

33. D.M. Simić, D.B. Stojanović, M. Dimić, K. Mišković, M. Marjanović, Z. Burzić, P.S. Uskoković, **A. Zak**, R. Tenne (2019)
Impact resistant hybrid composites reinforced with inorganic nanoparticles and nanotubes of WS_2
Composites Part B: Engineering, 176, November 2019 (107222)
WoS: Q1, IF: 10.133, JCR citations: 19

34. Y.J. Zhang, T. Ideue, M. Onga, F. Qin, R. Suzuki, **A. Zak**, R. Tenne, J.H. Smet, Y. Iwasa (2019)
Letter: Enhanced intrinsic photovoltaic effect in tungsten disulphide nanotubes
Nature, 570, June 2019 (349-363)
WoS: Q1, IF: 63.580, JCR citations: 126

35. M. Kolíbal, K. Bukvišová, L. Kachtík, **A. Zak**, L. Novák, T. Šikola (2019)
Formation of tungsten oxide nanowires by electron-beam-enhanced oxidation of WS_2 nanotubes and platelets
The J. of Physical Chemistry C, 123, March 2019 (9552-9559)
WoS: Q2, IF: 4.480

36. F. Qin, T. Ideue, W. Shi, X-X Zhang, M. Yoshida, **A. Zak**, R. Tenne, T. Kikitsu, D. Inoue, D. Hashizume, Y. Iwasa (2018)
Diameter-dependent superconductivity in individual WS_2 nanotubes
Nano Letters, 18(11), October 2018 (6789-6794)
[Research highlight of this paper appeared in the November issue of Nature Nanotechnology under the title "A furled superconductor" written by Benjamin Heinrich]
WoS: Q1, IF: 12.709, JCR citations: 22

37. Y.J. Zhang, M. Onga, F. Qin, W. Shi, **A. Zak**, R. Tenne, J. Smet, Y. Iwasa (2018)
Optoelectronic response of a WS_2 tubular ρ-n junction
2D Materials, 5(3), April 2018, 035002 (8 pages)
[https://doi.org/10.1088/2053-1583/aab670]
WoS: Q2, IF: 7.687, JCR citations: 31

38. E. Macchia, **A. Zak**, R.A. Picca, K. Manoli, C. Di Franco, N. Cioffi, G. Scamarcio, R. Tenne, L. Torsi (2018)
Improved performance p-type Polymer (P3HT)/n-type nanotubes (WS_2) electrolyte gated thin-film transistor
MRS Advances (Biomaterials and Soft Materials), 3(27), (1525-1533)
WoS: Q4, JCI: 0.13, JCR citations: 3

39. J.I. Martinez, A. Laikhtman, H.R. Moon, **A. Zak**, J.A. Alonso (2018)
Modelling of adsorption and intercalation of hydrogen on/into tungsten disulphide multilayers and multiwall nanotubes
Physical Chemistry Chemical Physics, 20(17), April 2018 (12061-12074)
WoS: Q1, IF: 3.861, JCR citations: 4

D. Articles in Refereed Journals, contd.

Published

40. A. Yu. Polyakov, **A. Zak**, R. Tenne, E.A. Goodilin, K.A. Solntsev (2018)
Nanocomposites based on tubular and onion nanostructures of molybdenum and tungsten disulfides: Inorganic design, functional properties and applications
Russian Chemical Reviews, 87(3), (251-271)
WoS: Q1, IF: 5.811, JCR citations: 11

41. S-J Huang, W-Y Peng, B. Visic, **A. Zak** (2018)
Al alloy metal matrix composites reinforced by WS_2 inorganic nanomaterials
Materials Science & Engineering A: Structural Materials: Properties, Microstructure & Processing, 709, January 2018 (290-300)
WoS: Q1, IF: 5.985, JCR citations: 20

42. J. Macutkevic, J. Belovickis, G. Otorgust, H. Dodiuk, S. Kenig, V. Samulionis, J. Banys, **A. Zak** (2018)
Broadband dielectric and ultrasonic properties of WS_2 nanotubes/polyurethane composites
Polymer Composites, 39(12), August 2018 (4477-4485)
[DOI: 10.1002/pc.24554]
WoS: Q2, IF: 2.980

43. O. Grinberg, S. Deng, E. Zussman, T. Livneh, **A. Zak** (2017)
Raman scattering from single WS_2 nanotubes in stretched PVDF electrospun fibers
Physical Chemistry Chemical Physics (PCCP), 19, (18443-18451)
[Key scientific article contributing to excellence in science and engineering research, featured online in Advances in Engineering)
WoS: Q1, IF: 3.861, JCR citations: 20

44. A. Laikhtman, G. Makrinich, M. Sezen, M. Mercan, Yildizhan, J.I. Martinez, D. Dinescu, M. Prodana, M. Enachescu, J.A. Alonso, **A. Zak** (2017)
Hydrogen chemical configuration and thermal stability in tungsten disulfide nanoparticles exposed to hydrogen plasma
J. of Physical Chemistry C, 121(21), 2017 (11747-11756)
WoS: Q2, IF: 4.480, JCR citations: 5

45. F. Qin, W. Shi, T. Ideue, M. Yoshida, **A. Zak**, R. Tenne, T. Kikitsu, D. Inoue, D. Hashizume, Y. Iwasa
Superconductivity in a chiral nanotube (2017)
Nature Communications, 8
[doi:10.1038/ncomms14465, published online 16 February 2017]
WoS: Q1, IF: 17.763, JCR citations: 116

46. F. Wang, I.A. Kinloch, D. Wolverson, T. Reshef, **A. Zak**, E. O'Connell, U. Bangert, R.J. Young (2016)
Strain-induced phonon shifts in tungsten disulfide nanoplatelets and nanotubes
2D Materials, 4, 015007 (14 pages)
WoS: Q2, IF: 7.687, JCR citations: 57

47. V.K. Ksenevich, N.I. Gorbachuk, Ho Viet, M.V. Shuba, P.P. Kuzhir, S.A. Maksimenko, A.G. Paddubskaya, G. Valusis, A.D. Wieck**, A. Zak**, R. Tenne (2016)
Electrical properties of carbon nanotubes/WS_2 nanotubes (nanoparticles) hybrid films
Nanosystems: Physics, Chemistry, Mathematics, 7(1), (37-43)
WoS: Q4, JCI: 0.15, JCR citations: 9

48. K.R. O'Neal, J.G. Cherian, **A. Zak**, R. Tenne, Z. Liu, J.L. Musfeldt (2016)
High pressure vibrational properties of WS_2 nanotubes
Nano Letters, 16, (993-999)
WoS: Q1, IF: 12.709, JCR citations: 33

D. Articles in Refereed Journals, contd.

Published

49. A. Sedova, G. Bar, O. Goldbart, R. Ron, B. Achrai, I. Kaplan-Ashiri, V. Brumfeld, **A. Zak**, R. Gvishi, H.D. Wagner, R. Tenne (2015)
Reinforcing silica aerogels with tungsten disulfide nanotubes
The J. of Supercritical Fluids, 106, (9-15)
WoS: Q2, IF: 4.303, JCR citations: 10

50. K. Vasu, S.S.R.K.C. Yamijala, **A. Zak**, K. Gopalakrishnan, S.K. Pati, C.N.R. Rao (2015)
Clean WS_2 and MoS_2 nanoribbons generated by laser-induced unzipping of the nanotubes
Small, 11(32), (3916-3920)
WoS: Q1, IF: 14.257, JCR citations: 20

51. B. Seo, H.Y. Jeong, S.Y. Hong, **A. Zak**, S.H. Joo (2015)
Impact of a conductive oxide core in tungsten sulfide-based nanostructures on the hydrogen evolution reaction
Chemical Communications, 51, (8334-8337)
WoS: Q2, IF: 5.976, JCR citations: 41

52. E.B. Goldman, **A. Zak**, R. Tenne, E. Kartvelishvily, S. Levin-Zaidman, Y. Neumann, R. Stiubea-Cohen, A. Palmon, A.H. Hovav, D.J. Aframian (2015)
Biocompatibility of tungsten disulfide inorganic nanotubes and fullerene-like nanoparticles with salivary gland cells
Tissue Engineering, Part A, 21(5-6), (1013-1023)
WoS: Q3, IF: 4.541, JCR citations: 46

53. G. Viskadouros, **A. Zak**, M. Stylianakis, E. Kymakis, R. Tenne, E. Stratakis (2014)
Enhanced field emission of WS_2 nanotubes
Small, 10(12), (2398-2403)
WoS: Q1, IF: 14.257, JCR citations: 36

54. M. Naffakh, C. Marco, G. Ellis, S.R. Cohen, A. Laikhtman, L. Rapoport, **A. Zak** (2014)
Novel poly(3-hydroxybutyrate) nanocomposites containing WS_2 inorganic nanotubes with improved thermal, mechanical and tribological properties
Materials Chemistry and Physics, 147, (273-284)
[presented at the 8th COINAPO Topical Meeting Composites of Inorganic Nanotubes & Polymers, Crete, Greece, 14-16 October 2013]
WoS: Q2, IF: 4.233, JCR citations: 32

55. A. Laikhtman, S. Michaelson, A. Hoffman, T.K. Kim, H.R. Moon, **A. Zak** (2014)
Using hydrogen activated by microwave plasma vs. molecular hydrogen for hydrogen storage in tungsten sulfide inorganic nanotubes
Int'l. J. of Hydrogen Energy, 39, (9837-9841)
WoS: Q2, IF: 6.200, JCR citations: 5

56. V. Brüser, R. Popovitz-Biro, A. Albu-Yaron, T. Lorenz, G. Seifert, R. Tenne, **A. Zak** (2014)
Single- to triple-wall WS_2 nanotubes obtained by high-power plasma ablation of WS_2 multiwall nanotubes
Inorganics, 2, (177-190)
WoS: Q2, IF: 2.641, JCR citations: 22

57. C.L. Choi, J. Feng, Y. Li, J. Wu, **A. Zak**, R. Tenne, H. Dai (2013)
WS_2 nanoflakes from nanotubes for electrocatalysis
Nano Research, 6(12), (921-928)
WoS: Q1, IF: 9.240, JCR citations: 92

58. D. Rajh, S. Shelestiuk, A. Mertelj, A. Mrzel, P. Umek, S. Irusta, **A. Zak**, I. Drevenšek-Olenik (2013)
Effect of inorganic 1D nanoparticles on electrooptic properties of 5CB liquid crystal
Physica Status Solidi A: Applications & Materials Science, 210(11), (2328-2334)
WoS: Q3, IF: 1.948, JCR citations: 14

D. Articles in Refereed Journals, contd.

Published

59. R. Tenne, R. Rosentsveig, **A. Zak** (2013)
Inorganic nanotubes and fullerene-like nanoparticles: Synthesis,
mechanical properties, and applications
Physica Status Solidi A: Applications & Materials Science, (1-6) DOI 10.100/pssa.201329309
WoS: Q3, IF: 1.948, JCR citations: 18

60. D-M Tang, X. Wei, M-S Wang, N. Kawamoto, Y. Bando, C. Zhi, M. Mitome, **A. Zak**,
R. Tenne, D. Golberg (2013)
Revealing the anomalous tensile properties of WS_2 nanotubes
by in situ transmission electron microscopy
Nano Letters, 13, (1034-1040)
WoS: Q1, IF: 12.709, JCR citations: 38

61. M. Shneider, L. Rapoport, A. Moshkovich, H. Dodiuk, S. Kenig, R. Tenne, **A. Zak** (2013)
Tribological performance of the epoxy-based composite reinforced by WS_2 fullerene-like
nanoparticles and nanotubes
Physica Status Solidi A: Applications & Materials Science, 210(11), (2298-2306)
WoS: Q3, IF: 1.948, JCR citations: 32

62. C. Zhang, Z. Ning, Y. Liu, T. Xu, Y. Guo, **A. Zak**, Z. Zhang, S. Wang, R. Tenne, Q. Chen (2012)
Electrical transport properties of individual WS_2 nanotubes and their dependence on
water and oxygen absorption
Applied Physics Letters, 101, (113112-1–113112-5)
WoS: Q2, IF: 3.816, JCR citations: 30

63. M. Staiger, P. Rafailov, K. Gartsman, H. Telg, M. Krause, G. Radovsky, **A. Zak**,
C. Thomsen (2012)
Excitonic resonances in WS_2 nanotubes
Physical Review B: Condensed Matter, 86(16), (165423-1–165423-9)
WoS: Q2, IF: 3.808, JCR citations: 37

64. M.R. Komarneni, Z. Yu, U. Burghaus, Y. Tsverin, **A. Zak**, Y. Feldman, R. Tenne (2012)
Characterization of Ni-coated WS_2 nanotubes for hydrodesulfurization catalysis
Israel J. of Chemistry, 52, (1053-1062)
WoS: Q3, IF: 2.790, JCR citations: 11

65. Y. Tsverin, T. Livneh, R. Rosentsveig, **A. Zak**, I. Pinkas, R. Tenne (2012)
Photocatalysis with hybrid co-coated WS_2 nanotubes
Nanomaterials and Energy, 2(NME1), (27-36) [best paper]
WoS: Q4, JCI: 0.18, JCR citations: 11

66. C. Zhang, S. Wang, L. Yang, Y. Liu, T. Xu, Z. Ning, **A. Zak**, A. Zak, Z. Zhang,
R. Tenne, Q. Chen (2012)
High-performance photodetectors for visible and near-infrared lights
based on individual WS_2 nanotubes
Applied Physics Letters, 100, (243101-1–243101-5)
WoS: Q2, IF: 3.816, JCR citations: 89

67. R. Kreizman, O. Schwartz, Z. Deutsch, S. Itzhakov, **A. Zak**, S.R. Cohen, R. Tenne, D. Oron (2012)
Semiconductor quantum dot-inorganic nanotube hybdrids
Physical Chemistry Chemical Physics, 14, (4271-4275)
WoS: Q1, IF: 3.861, JCR citations: 9

68. M. Krause, A. Mücklich, **A. Zak**, G. Seifert, S. Gemming (2011)
High resolution TEM study of WS_2 nanotubes
Physica Status Solidi B: Basic Solids State Physics, 248(11), (2716-2719)
WoS: Q3, IF: 1.727, JCR citations: 28

D. Articles in Refereed Journals, contd.

Published

69. C.S. Reddy, **A. Zak**, E. Zussman (2011)
WS_2 nanotubes embedded in PMMA nanofibers as energy absorptive material
J. of Materials Chemistry, 21, (16086-16093)
[presented at the 4th COINAPO Topical Meeting Composites of Inorganic Nanotubes & Polymers, Ljubljana, Slovenia, 8-9 December 2011]
WoS: Q1, IF: 6.473 (2013), JCR citations: 79

70. E. Zohar, S. Baruch, M. Shneider, H. Dodiuk, S. Kenig, H. Daniel Wagner, **A. Zak**, A. Moshkovith, L. Rapoport, R. Tenne (2011)
The mechanical and tribological properties of epoxy nanocomposites with WS_2 nanotubes
Sensors & Transducers J., Special Issue, 12, (53-65)
[presented at the 5th COINAPO Topical Meeting Composites of Inorganic Nanotubes & Polymers, Prague, Czech Republic, 17-19 April 2012]

71. **A. Zak**, L.S. Ecker, R. Efrati, L. Drangai, N. Fleischer, R. Tenne (2011)
Large-scale synthesis of WS_2 multiwall nanotubes and their dispersion, an update
Sensors & Transducers J., Special Issue, 12, (1-10)
[presented at the 3rd COINAPO Topical Meeting Composites of Inorganic Nanotubes & Polymers, Sestriere, Italy, 2-3 March 2011]

72. **A. Zak**, L. Sallacan-Ecker, A. Margolin, Y. Feldman, R. Popovitz-Biro, A. Albu-Yaron, M. Genut, R. Tenne (2011)
Scaling up of the WS_2 nanotubes synthesis
Fullerenes, Nanotubes, and Carbon Nanostructures
19(1), (18-26)
WoS: Q3, IF: 2.054

73. U. Burghaus **A. Zak**, R. Rosentsveig (2010)
Site-specific surface chemistry on nanotubes
Israel J. of Chemistry, 50, (449-452)
WoS: Q3, IF: 2.790

74. S.Y. Hong, R. Kreizman, R. Rosentsveig, **A. Zak**, J. Sloan, A.N. Enyashin, G. Seifert, M.L.H. Green, R. Tenne (2010)
One- and two-dimensional inorganic crystals inside inorganic nanotubes
European J. of Inorganic Chemistry, 2010(27), (4233-4243)
WoS: Q2, IF: 2.500, JCR citations: 17

75. R. Rosentsveig, A. Gorodnev, N. Feuerstein, H. Friedman, **A. Zak**, N. Fleischer, J. Tannous, F. Dassenoy, R. Tenne (2009)
Fullerene-like MoS_2 nanoparticles and their tribological behavior
Tribology Letters, 36, (175-182)
WoS: Q2, IF: 3.355

76. M. Komarneni, A. Sand, P. Nevin, **A. Zak**, U. Burghaus (2009)
Adsorption and reaction kinetics of small organic molecules on WS_2 nanotubes:
An ultra-high vacuum study
Chemical Physics Letters, 479, (109-112)
WoS: Q3, IF: 2.255

77. **A. Zak**, L. Sallacan-Ecker, A. Margolin, M. Genut, R. Tenne (2009)
Insight into the growth mechanism of WS_2 nanotubes in the scaled-up fluidized bed reactor
Nano, 4, (91-98)
WoS: Q4, IF: 1.374, JCR citations: 116

D. Articles in Refereed Journals, contd.

Published

78. J. Goering, U. Burghaus, B.W. Arey, O. Eidelman, **A. Zak**, R. Tenne (2008)
Reactive and non-reactive interactions of thiophene with WS_2 fullerene-like nanoparticles: An ultra-high vacuum surface chemistry study
Catalysis Letters, 125(3-4), (236-242)
WoS: Q3, IF: 2.795, JCR citations: 12

79. B. Späth, F. Kopnov, H. Cohen, **A. Zak**, A. Moshkovich, L. Rapoport, W. Jägermann, R. Tenne (2008)
X-ray photoelectron spectroscopy and tribology studies of annealed fullerene-like WS_2 nanoparticles
Physica Status Solidi B: Basic Solid-State Physics, 245(9), (1779-1784)
WoS: Q3, IF: 1.727

80. F. Kopnov, Y. Feldman, R. Popovitz-Biro, A. Vilan, H. Cohen, **A. Zak**, R. Tenne (2008)
Intercalation of alkali metal in WS_2 nanoparticles, revisited
Chemistry of Materials, 20(12), (4099-4105)
WoS: Q1, IF: 11.162

81. S. Brown, J.L. Musfeldt, I. Mihut, J.B. Betts, A. Migliori, **A. Zak**, R. Tenne (2007)
Bulk vs nanoscale WS_2: Finite size effects and solid-state lubrication
Nano Letters, 7(8), (2365-2369)
WoS: Q1, IF: 12.709

82. Y. Feldman, **A. Zak**, R. Tenne, H. Cohen (2003)
Evidences for dry deintercalation in layered compounds upon controlled surface charging in x-ray photoelectron spectroscopy
J. of Vacuum Science & Technology A-Vacuum Surfaces and Films, 21(5), (1752-1757)
WoS: Q2, IF: 2.751

83. **A. Zak**, Y. Feldman, V. Lyakhovitskaya, G. Leitus, R. Popovitz-Biro, E. Wachtel, H. Cohen, S. Reich, R. Tenne (2002)
Alkali metal intercalated fullerene-like MS_2 (M=W,Mo) nanoparticles and their properties
J. of the American Chemical Society, 124(17), (4747-4758)
WoS: Q1, IF: 16.289

84. L. Rapoport, M. Lvovsky, I. Lapsker, V. Leshchinsky, Yu Volovik, Y. Feldman, **A. Zak**, R. Tenne (2001)
Slow release of fullerene-like WS_2 nanoparticles as a superior solid lubrication mechanism in composite matrices
Advanced Engineering Materials, 3, (71-75)
WoS: Q2, IF: 4.166

85. Y. Feldman, **A. Zak**, R. Popovitz-Biro, R. Tenne (2000)
New reactor for production of tungsten disulfide hollow onion-like (inorganic fullerene-like) nanoparticles
Solid State Sciences, 2, (663-672)
WoS: Q2, IF: 3.097

86. **A. Zak**, Y. Feldman, V. Alperovich, R. Rozentsveig, R. Tenne (2000)
Growth mechanism of MoS_2 fullerene-like nanoparticles by gas-phase synthesis
J. of the American Chemical Society, 122(45), (11108-11116)
WoS: Q1, IF: 16.289

F. Articles in Conference Proceedings

Published

*1. O. Durante, S. De Stefano, D. Capista, M. Passacantando, **A. Zak**, F. Giubileo, L. Camilli, A. Di Bartolomeo (2023)
Multiwalled WS_2 nanotubes on interdigitated electrodes for visible-light photodetectors
2023 IEEE Nanotechnology Materials and Devices Conf. (NMDC)
Paestum, Salerno, Italy, 22-25 October 2023 (676-680)

*2. S. Ghosh, P. Chithaiah, K. Manjunath, T. Livneh, I. Kaplan-Ashiri, V. Bruser, A. Bartolomeo, Y. Zhang, Y. Iwasa, **A. Zak** (2022)
Synthetic route towards pure phase of WS_2 and MOS_2 inorganic nanotubes and their unusual properties
The 86th Annual Meeting of the Israel Chemical Society
Tel-Aviv, Israel, 12-13 September 2022 [poster]

3. A. Laikhtman, **A. Zak**, J.I. Martinez, J.A. Alonso (2021)
Hydrogen interaction with tungsten disulfide nanostructures
2021 IEEE 2nd khPi Week on Advanced Technology (KhPI Week)
Kharkiv, Ukraine, 13-17 September 2021 (714-719)
DOI: 10.1109/KhPIWeek53812.2021.9570070 [fully refereed - **plenary lecture**]

4. **A. Zak** (2018)
From multi- to single wall inorganic nanotubes of WS_2 and MoS_2, their synthesis and properties in: Raman scattering under tensile and pressure, composites, photovoltaic effect and hydrogen storage
4th Int'l. Conf. NANOCON 2018 "Nanotechnology-Applications, Advances and Innovations"
Pune, India, 25-26 October 2018 **[keynote lecture]**

5. **A. Zak** (2018)
Single wall and multiwall WS_2 Inorganic NanoTubes (INT), their synthesis, properties and applications
Int'l. Conf. on Functional Nanomaterials and Nanodevices
Vienna, Austria, 3-5 September 2018 **[invited lecture]**

6. **A. Zak** (2017)
Single wall and multiwall WS_2 nanotubes synthesis and characterization – The update
11th Int'l. Conf. on Advanced Materials & Processing
Edinburgh, Scotland, 7-8 September 2017 **[keynote lecture]**

7. **A. Zak** (2016)
Single wall and multiwall WS_2 nanotubes synthesis and characterization – The update
2nd Greece-Israel Joint Meeting on Nanotechnology and BioNanscience
Heraklion, Crete, Greece, 25-28 October 2016 **[invited lecture]**

8. M. Naffakh, T. Silverman, A.M. Garcia, D.A. Moreno, C. Marco, G. Ellis, **A. Zak** (2015)
Novel biopolymer composites based on WS_2 inorganic nanotubes
Proc. 20th Int'l. Conf. on Composite Materials (ICCM20)
Copenhagen, Denmark, 19-24 July 2015 (9 pages)

9. V.K. Ksenevich, N.I. Gorbachuk, Ho Viet, A. Paddubskaya, A.D. Wieck, **A. Zak** (2015)
Impedance characterization of SWCNT/WS_2-NT hybrid films
Physics, Chemistry and Applications of Nanostructures
Proc. of Int'l. Conf. Nanomeeting – 2015
Minsk, Belarus, 26-29 May 2015 (196-199)

*Since last promotion

F. Articles in Conference Proceedings, contd.

Published

10. A. Laikhtman, G. Makrinich, A. Fruchtman, **A. Zak**, T.K. Kim, H.R. Moon, M. Enachescu, M. Sezen (2015)
Advanced spectroscopy methods for characterization of tungsten disulfide nanoparticles as a medium for hydrogen storage. Collaboration in the framework of the Cost European Cooperation Action
Physics, Chemistry and Applications of Nanostructures
Proc. of Int'l. Conf. Nanomeeting – 2015
Minsk, Belarus, 26-29 May 2015

11. **A. Zak**, A. Hoffman, H.R. Moon, A. Laikhtman (2014)
Using hydrogen activated by microwave plasma vs. molecular hydrogen for hydrogen storage in tungsten disulfide inorganic nanotubes
2nd Int'l. Symp. on Energy Challenges and Mechanics (ISECM)
Aberdeen, Scotland, 19-21 August 2014

12. **A. Zak**, R. Tenne, L. Rapoport, H. Dodiuk, E. Zussman (2014)
Composites of different polymers with WS_2 nanoparticles and nanotubes
The 22nd Annual Int'l. Conf. on Composites/Nano Engineering (ICCE-22)
Malta, 13-19 July 2014

13. **A. Zak**, L. Sallacan-Ecker, A. Margolin, Y. Feldman, R. Popovitz-Biro, A. Albu-Yaron, M. Genut, R. Tenne (2009)
Scaling-up of the WS_2 nanotubes synthesis
IWFAC 2009 – 9th Biennial Int'l. Workshop Fullerenes and Atomic Clusters
St. Petersburg, Russia, July 2009

14. R. Rosentsveig, A. Gorodnev, N. Feuerstein, H. Friedman, **A. Zak**, N. Fleischer, J. Tannous, F. Dassenoy, R. Tenne (2009)
Fullerene-like MoS_2 nanoparticles and their tribological behavior
Proc. Vien Nano09, Vienna, March 2009

15. **A. Zak**, L. Sallacan-Ecker, A. Margolin, M. Genut, R. Tenne (2009)
Large scale synthesis of WS_2 nanotubes as building block for new nanocomposites
Proc. 6th Int'l. Conf. on Condition Monitoring and Machinery Failure Prevention Technologies 2009
Dublin, Ireland, 23-25 June 2009

16. F. Kopnov, R. Tenne, B. Späth, W. Jägermann, H. Cohen, Y. Feldman, **A. Zak**, A. Moshkovich, L. Rapoport (2008)
X-ray photoelectron spectroscopy and tribology studies of annealed fullerene-like WS_2 nanoparticles
Functionalized Nanoscale Materials, Devices and Systems, Part I, 2008 (51-59)
Proc. NATO Advanced Study Institute on Functionalized Nanoscale Materials, Devices and Systems for Chem.-bio Sensors, Photonics, and Energy Generation and Storage
Sinaia, Romania, 4-15 June 2007 [ISBN: 978-1-4020-8901-5]

17. M. Genut, N.A. Fleischer, **A. Zak**, L. Rapoport, R. Tenne (2006)
Fullerenes fight friction, giant inorganic molecules give exceptional performance as dry lubricants
ECJ – European Coatings Conf. "Smart Coatings V"
Berlin, Germany, 15 May 2006 (2-10)

I. Other Publications

a. Magazines

1. **A. Zak**, N. Fleischer, M. Zarbuv, L. Drangai, M. Genut (2009)
Nanomaterials for gear lubrication solutions
Gear Solutions Magazine, December 2009 (30-36)

I. Other Publications

b. Patents

1. R. Tenne, Y. Feldman, **A. Zak**, R. Rosentsveig (2009)
   Reactors for producing inorganic fullerene-like tungsten disulfide hollow nanoparticles and nanotubes
   US Patent No.US 7,524,481 B2, Date of Patent: 28 April 2009

2. R. Tenne, Y. Feldman, **A. Zak**, R. Rosentsveig (2006)
   Method and apparatus for producing inorganic fullerene-like nanoparticles
   US Patent No.US 7,0186,606 B2, Date of Patent: 28 March 2006

c. Patent Application Publications

*1. G. Yao, L. Zhonggui, H. Zinyl, N. Yue, Q. Zhiying, **A. Zak** (2023)
   A zero-dimensional slip ferroelectric diode and its production method
   Beijing Inst. of Technology Application No.2023114129040, Application Date: 30 October 2023

*2. **A. Zak**, S. Ghosh, M. Krishnappa, C. Pallellappa, Y. Feldman, M. Bar-Sadan (2023)
   Method and system for producing molybdenum disulfide inorganic nanotubes
   US Application No.18/352,891, Application Date: 14 July 2023

I. Other Publications

d. Abstracts

Accepted for presentation:

1. **A. Zak**, O. Grinberg, R. Popovich-Biro, R. Tenne, V. Brueser, E. Zussman, T. Livneh (2016)
   Single wall and multiwall nanotubes of WS_2: Their synthesis, properties and applications
   5th Int'l. Conf. Smart and Multifunctional Materials Structures & Systems, and
   11th Int'l. Conf. Medical Applications of Novel Biomaterials & Nanotechnology (CIMTEC 2016)
   Perugia, Italy, 5-9 June 2016 [oral]❸

Published

2. **A. Zak**, G. Ghosh, C. Pallellappa, T. Livneh, I. Kaplan-Ashiri, Y. Zhang, Y. Iwasa,
   V. Bruser, A. Di Bartolomeo (2020)
   Synthetic route towards pure phase of WS_2 and MoS2 inorganic nanotubes
   and their unusual properties
   IVS-IPSTA 2020 – 38th Annual Conf. of the Israel Vacuum Society jointly with
   Israeli Conf. on Plasma Science and Applications, 13 December 2020 [online]
   Book of Abstracts, page 21

3. S.S. Sinha, R. Rosentsveig, **A. Zak**, I. Pinkas, R. Tenne, L. Yadgarov (2019)
   Control of exciton-polariton interactions in nano regime: Prediction of nanotube diameter
   7th Int'l. Conf. Flatlands Beyond Graphene
   Toulouse, France, 2-6 September 2019 [poster]

4. S. Ghosh, G. Otorgust, O. Regev, D.Y. Lewitus, **A. Zak** (2019)
   Reinforcement of poly (methyl methacrylate) by WS_2 nanotubes towards antiballistic applications
   7th Int'l. Conf. Flatlands Beyond Graphene
   Toulouse, France, 2-6 September 2019 [poster]

5. S. Ghosh, R. Popovitz-Biro, I. Ashiri-Kaplan, V. Brüser, **A. Zak** (2018)
   Cathodoluminescence studies of single to Penta-wall WS_2 nanotubes obtained through
   plasma treatment of WS_2
   NANO.IL.2018 – Int'l. Nanotechnology Conf.,
   Jerusalem, Israel, 9-11 October 2018 [poster]

*Since last promotion

❸ Did not attend conference due to health reasons

I. Other Publications, contd.

d. Abstracts

6. **A. Zak** (2018)
Synthesis, properties and applications of inorganic nanotubes of MoS_2 and WS_2
EMN Meeting on Nanowires 2018
Prague, Czech Republic, 11-15 June 2018

7. C. Pallellappa, A. Idelevich, L. Rovinsky, V. Brueser, **A. Zak** (2018)
Inorganic NanoTubes (INT) of MoS_2 and WS_2: Their synthesis, properties and applications
BIT's 4th Annual World Congress of SmartMaterials-2018
Osaka, Japan, 6-8 March 2018

8. M. Straticiuc, **A. Zak**, M. Nistor, E. Matei, M. Manea, I. Burducea, F. Gherendi, P. Dinca
INT-WS_2 Niobium implantation studies (2016)
24th Int'l. Conf. on the Application of Accelerators in Research and Industry (CAARI 2016)
Fort Worth, Texas, USA, 30 October-4 November 2016

9. O. Grinberg, R. Avrahami, E. Zussman, T. Livneh, **A. Zak** (2016)
Raman scattering from single WS_2 nanotubes embedded within stretched PVDF nanofibers
2nd Greece-Israel Joint Meeting on Nanotechnology and BioNanscience
Heraklion, Crete, Greece, 25-28 October 2016 [poster]

10. C. Pallellappa, **A. Zak** (2016)
Reproducible synthesis of MoS_2 nanotubes with controllable aspect ratio via sulfidization of preliminary grown MoO3-x nanowhiskers
2nd Greece-Israel Joint Meeting on Nanotechnology and BioNanscience
Heraklion, Crete, Greece, 25-28 October 2016 [poster]

11. V. Brueser, R. Popovich-Biro, **A. Zak** (2016)
Plasma treatment of MWINT-WS_2 for synthesis of single wall nanotubes of WS_2
The 5th Int'l. Nanotechnology Conf. and Exhib. (NanoIsrael 2016)
Tel-Aviv, Israel, 22-23 February 2016 [poster]

12. O. Grinberg, **A. Zak** (2016)
Raman scattering from single WS_2 nanotubes embedded within stretched PVDF submicron fibers
The 5th Int'l. Nanotechnology Conf. and Exhib. (NanoIsrael 2016)
Tel-Aviv, Israel, 22-23 February 2016 [poster]

13. K.R. O'Neal, J.G. Cherian, **A. Zak**, R. Tenne, Z. Liu, J.L. Musfeldt (2015)
Revealing the pressure-induced breakdown pathway in WS_2 nanotubes
8th Int'l. Workshop on Infrared Microscopy and Spectroscopy with Accelerator
Based Sources (WIRMS 2015)
Riverhead, Long Island, New York, USA, 11-15 October 2015

14. M. Naffakh, T. Silverman, A.M. Garcia, D.A. Moreno, C. Marco, G. Ellis, **A. Zak** (2015)
Novel biopolymer composites based on WS_2 inorganic nanotubes
20th Int'l. Conf. on Composite Materials (ICCM20)
Book of Abstracts
Copenhagen, Denmark, 19-24 July 2015

15. O. Grinberg, R. Avrahami, E. Zussman, T. Livneh, **A. Zak** (2015)
Raman scattering from single WS_2 nanotubes embedded within stretched PVDF microfibers
Flatlands Beyond Graphene 2015
Bar Ilan University, Israel, 7-9 July 2015

16. **A. Zak**, A. Laikhtman, R. Popovich Biro, R. Tenne, V. Brueser (2015)
Plasma treatment of MWINT-WS_2 for synthesis of single wall nanotubes of WS_2 and for hydrogen storage
Flatlands Beyond Graphene 2015
Bar Ilan University, Israel, 7-9 July 2015 [oral]

I. Other Publications, contd.

d. Abstracts

Published

17. **A. Zak** (2014)
Inorganic (WS_2) fullerene-like nanoparticles and multiwall nanotubes and their application in novel polymer nanocomposites
Research Workshop of the Israel Science Foundation (COMPO 2014) Nanocomposites and Biocomposites
Weizmann Institute of Science, Rehovot, Israel, 28 April-1 May 2014 [poster]

18. **A. Zak** (2014)
Inorganic (WS_2) multiwall nanotubes and fullerene-like nanoparticles and their application in novel polymer nanocomposites
The 4th Int'l. Nanotechnology Conf. and Exhib. (NANOISRAEL 2014)
InterContinental Hotel, Tel-Aviv, Israel, 24-25 March 2014 [poster]

19. **A. Zak**, R. Tenne, L. Rapoport, E. Zussman (2013)
Inorganic (WS_2) fullerene-like nanoparticles and multiwall nanotubes and their application in novel polymer nanocomposites
Materials Research Society Fall Meeting
Boston, MA, USA, 1-6 December 2013 [poster]

20. **A. Zak**, M. Schneider, A. Moshkovich, H. Dodiuk, S. Kenig, R. Tenne, L. Rapoport (2012)
Influence of inorganic WS_2 nanoparticles on the tribological properties of epoxy resin
NanoIsrael-12 – The 3rd Int'l. Nanotechnology Conf. and Exhibition
Weizmann Institute of Science, Rehovot, Israel, 26-27 March 2012 [poster]

21. **A. Zak** (2011)
The mechanical and tribological properties of epoxy nanocomposites with WS_2 nanotubes
ChinaNANO 2011 – Int'l. Conf. on Nanoscience and Technology
Beijing, China, 7-9 September 2011 [poster]

22. **A. Zak** (2011)
The effect of fullerene-like tungsten disulfide and carbon nanotubes on the mechanical properties of epoxy adhesives
ChinaNANO 2011 – Int'l. Conf. on Nanoscience and Technology
Beijing, China, 7-9 September 2011 [poster]

23. **A. Zak** (2011)
Large-scale synthesis of WS_2 multiwall nanotubes
ChinaNANO 2011 – Int'l. Conf. on Nanoscience and Technology
Beijing, China, 7-9 September 2011 [poster]

K. Submitted Publications

*1. A. Dutta, M. Krishnappa, H. Porat, A. Lal, M. Kumar Yadav, A. Laikhtman, **A. Zak**, G. Makrinich, A. Borenstein (2024)
Plasma-treated 1D transition metal dichalcogenides for efficient electrocatalytic hydrogen evolution reaction
J. of Materials Chemistry A April 2024
WoS: Q1, IF: 10.8 (2023)

*Since last promotion