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Position: Professor of Inorganic Chemistry

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**Fields of Interest**

We are interested in the nano-chemistry: preparation of nanogold and nano silver and nano platinum using green chemistry without the addition of any chemicals and their possible applications, magnetic fluids of magnetite, and the effect of the variation in the  $\text{Fe}^{+2}$  substitution by  $\text{Co}^{+2}$  on the magnetic and optical properties of the magnetic fluids, the applications of nano-size modified  $\text{TiO}_2$  in photocatalytic degradation of organic pollutants also of main interest. Besides, doping natural polymers such as alginate with nano-magnetites and using them in the removal of some ions are also of interest. Also, the synthesis of new nanomaterials such as porous silica and metal-organic-framework and their applications in the removal and determination of metal ions is of interest to my group. Furthermore, environmental science especially materials for water treatment, water desalination etc.

seven master theses and two PhD. were done on this subject.

On the other hand, due to the importance of Schiff bases, interest in the preparation of inorganic complexes using Schiff bases such as salicylideneimine-2-anisole, salicylideneimine-2-thiophenol, 2-carboxyphenylhydrazo-benzoylacetone, 2-pyridylamidoxime and their applications have been investigated in my laboratory. Furthermore, a study on Schiff bases obtained from the condensation reactions of 2,3-diaminonaphthalene with salicylaldehyde and 1,8-diaminonaphthalene with 2-hdroxy-3-methoxy benzaldehyde and application of their complexes as ion selective electrodes are studied in my Lab. Amino acids metal complexes are also of great interest.

- Supervisor of 36 Master's and 40 PhD. thesis in the field of nonoscience, coordination chemistry, and environmental chemistry.

## (1) University Degrees:

1. B .Sc. degree (1984) from Faculty of Science, Ain Shames University (**Excellent with Honor degree**, Chemistry).
2. M.Sc. degree (1988) from Faculty of Science Ain Shams University (Chemistry). Theses title "*Photophysical Properties of the  $S_{1,CT}$  of some fluorescence probes and its analytical implications*".
3. Awarded a grant from a Belgium National Science Foundation to get a Ph.D. under supervision of Prof. Dr. F .C. De Schryver, from Katholieke Universiteit Leuven-Belgium, in 1993 (Excellent).

Ph.D Theses title "*Global compartmental analysis of the fluorescence decays of excited-state supermolecules: application to ground and excited state molecular recognition*"

Annex Theses title "*Conversion of sunlight to electrical power using dye sensitized semiconductor electrodes in photoelectrochemical cells*".

## (2) University Posts

1. **Demonstrator**: 22/9/1984-25/1/1988 at Chemistry Department, Faculty of Science, Ain Shames University.
2. **Assistant Lecturer**, M.Sc. 27/1/1988-27/9/1993 at Chemistry Department, Faculty of Science-Ain Shams University.
3. **Lecturer of Chemistry**, Ph.D. (Inorganic Chemistry) 27/09/1993 - 24/3/2001 at Chem. Dept. Faculty of Science-Ain Shams University.
4. **Assistant Professor** at Ain Shams University: (2001-2009)
5. **Assistant Professor** at King Khaled University (1/9/2000-22/5/2005).
6. **Professor of Inorganic Chemistry at Ain Shams University** (23-1-2010- Now)
- 7) **Director of the Central Laboratory (Ain Shams University)** 26/10/2011-30/10/2015.

- محكم في لجنة ترقيات الأساتذة والأساتذة المساعدين (اللجنة العلمية الدائمة الكيمياء اللاعضوية) للفترة من 2019-2022 والدورة 14 من 2022-2025.
- محكم في اللجنة العلمية الدائمة الترقيات الأساتذة والأساتذة المساعدين لعلوم وتكنولوجيا المواد- وزارة البحث العلمي.

- محكم في اللجنة العلمية الدائمة لعلوم البيئة (ترقيات الأساتذة والأساتذة المساعدين) مجلس المراكز والمعاهد والهيئات البحثية- وزارة البحث العلمي.

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## الأنشطة العلمية والتطبيقية

### 1- في مجال التدريس:

- أ) قام بتدريس مقررات الكيمياء غير العضوية المختلفة بمرحلة البكالوريوس والدراسات العليا بجامعة عين شمس وجامعة الملك خالد بالمملكة العربية السعودية و جامعة حلوان وقد تدرجت المقررات من مقررات تمهيدية (الكيمياء العامة لطلبة السنة الأولى) الى مقررات الدراسات العليا.
- ب) المشاركة في تأليف وتطوير ووضع المقررات الدراسية للطلاب في مرحلة البكالوريوس.
- ت) يستخدم الطرق والوسائل التعليمية الحديثة في التدريس مع تشجيع الطلاب علي استخدام الشبكة العنكبوتية في البحث والإطلاع علي الجديد في موضوع المقرر.

### 2- مشروع الجودة والاعتماد:

- عمل مندوبا للجودة عن قسم الكيمياء وقام بتجهيز مستندات الجودة و الاعتماد لجميع أعضاء قسم الكيمياء بالتعاون مع وحدة الجودة ووكيل الكلية لشئون الطلاب خلال الفترة من 2005-2010. عضو في مشروع CQAP.

### 3- الإشراف على رسائل الماجستير والدكتوراه:

- شارك ويشترك في الإشراف علي عدد (36) رسالة ماجستير و عدد (40) رسائل دكتوراه بكلية العلوم ومعهد البيئة بجامعة عين شمس ضمت طلاب من العراق وليبيا والسعودية والكويت . وقد قام أيضا بالإشراف منفردا علي رسالة دكتوراه لطالبة بكلية البنات بأبها- المملكة العربية السعودية بالإضافة الي الإشراف علي رسالة ماجستير بجامعة المنصورة قام الطالب بالجزء العملي بمركز الطاقة الضوئية-جامعة عين شمس. كما أشرف علي رسالة ماجستير بكلية العلوم جامعة بنها. وأيضا رسالة دكتوراة بجامعة دمياط وجامعة الأزهر وغيرهم.

### 4- تحكيم رسائل الماجستير والدكتوراه:

- قام بتحكيم 90 رسالة ماجستير و25 رسالة دكتوراه في العديد من الجامعات المصرية والهندية والماليزية والعراقية.

### 5- ترقيات أعضاء هيئة التدريس لدرجة أستاذ واستاذ مساعد خارج مصر:

- تحكيم سنته لدرجة استاذ في العراق و السعودية.
- ترقية استاذ مساعد في لبنان.
- المشاركة في الترقيات بمصر حيث اني محكم في لجنة ترقيات الأساتذة والأساتذة المساعدين للفترة من 2019-لحالي . ولجان الترقيات بالمراكز البحثية

### 6- دورات مشروع تنمية قدرات أعضاء هيئة التدريس والقيادات:

- 1- دورة "توكيد الجودة والاعتماد" في الفترة 62-6002/4/72 جامعة عين شمس
- 2- دورة "إدارة البحث العلمي" في الفترة 4-6002/7/6 جامعة عين شمس
- 3- دورة "إقتصاديات وتسويق البحوث العلمية" في الفترة 81-6002/7/02 ج. عين شمس
- 4- دورة "استخدام التكنولوجيا في التدريس" في الفترة 72-7002/1/92 جامعة عين شمس.
- 5- دورة "نظم الامتحانات وتقييم الطلاب" في الفترة 2-7002/1/4 جامعة عين شمس.
- 6- دورة "أخلاقيات البحث العلمي" في الفترة 71-0029/9/91 جامعة عين شمس
- أخري:
- 7- دورة اعداد كوادر لتقييم التأثير البيئي 24-26 يونيو 2013 -مركز الطاقة الضوئية.

### 7- المشاركة في المؤتمرات العلمية: شارك وساهم في المؤتمرات العلمية بالبحوث و التنظيم لبعض منها.

### 8- لجان قسم الكيمياء:

- يساهم ويساهم مساهمة بناءة في اللجان الآتية:
- 1- عضو لجنة الجداول الدراسية بشعبة الكيمياء غير العضوية.

2- عضو لجنة تحويل المقررات إلى نظام الساعات المعتمدة بالقسم.

3- عضو لجنة شراء الكيماويات وفحصها بالقسم.

4- عضو لجنة المعامل وتطويرها بالقسم.

5- رئيس شعبة الكيمياء غير العضوية 2010-2011 و من 2020 الي 2022

9- رئيس كمنترول الفرقة الثالثة 2010/2011

10 (المناصب الادارية: -مدير وحدة المعمل المركزي – جامعة عين شمس 2011-2015

الأبحاث المنشورة: 173 بحثا منهم 130 بحثا دوليا

**List of publications (Scopus ID: 7201756266)(ORCID 0000-0002-8031-2447)**

1. Development of epoxy coating with TiO<sub>2</sub> nanoparticles for self-cleaning applications **Innovative Infrastructure Solutions** accepted 8/6/2024
2. Magnetized Cubic Zinc MOFs for Efficient Removal of Hazardous Cationic and Anionic Dyes in Aqueous Solutions R. R. Abd El-Mouhsen<sup>1</sup>, G. O. El-Sayed<sup>2</sup>, H. H. El-Feky<sup>2</sup>, **Mostafa M.H.Khalil\*** I. M. El-Sewify **RSC Advances**, (2024) 14, 19322–19330 accepted 7/6/2024 publ. 17/6/24
3. Hydroxyethyl cationic surfactants as corrosion inhibitors for S90 steel in produced water: Electrochemical, and computational studies Mohamed A. El-Monem, Ahmed A. Farag, **Mostafa M.H.Khalil**, Mohamed A. Migahed **Journal of Molecular Structure**, (2024), accepted 20/5/2024.  
doi: <https://doi.org/10.1016/j.molstruc.2024.138702>
4. Effective Adsorption of Fluorescent Congo Red Azo Dye from Aqueous Solution by Green Synthesized Nanosphere ZnO/CuO Composite Using Propolis as Bee Byproduct Extract, **A. Radwan**, **S. O. Mohamed**, **M. M.H.Khalil\***, **I. M. El-Sewify\*** **Scientific Reports** 14(1):90612024 .accepted 27/3/2024).
5. Enhancing acne treatment with novel ternary metal complexes embedded in solid lipid nanoparticles: Development, *in vitro* characterization, and clinical evaluation **Ehab R. Bendas**, **Eglal R. Souaya**, **Mostafa M. H. Khalil** 2, **Ossama S. Neaz** **Nanomedicine Journal** 2024; 11(1):36-43. DOI: [10.22038/NMJ.2023.75209.1825](https://doi.org/10.22038/NMJ.2023.75209.1825).
6. Assessment of the Toxicological and Biological Effects of the Essential Oil of *Lavandula angustifolia* and its Nanoemulsion against the Aquatic *Culex pipiens* Larvae (Diptera: Culicidae) **Nermeen M. Farahat**, **Mohamed A.**

Hussein, Amany S. Khaled , Mostafa M.H.Khalil , Ola H. Zyaan **Egyptian Journal of Aquatic Biology & Fisheries** 28(2): 915 – 933 (2024).

7. Enhancement of the Wastewater Effluent Quality by Alum Sludge Nesrin Abdelrhman, Mostafa M.H.Khalil, Mahmoud Abdelrhman, **Egyptian Journal of Chemistry** accepted
8. Upgrading and Surface Coating of Egyptian White Sand with Polymers and Silanes, Khaled E. Yassin, S.H. Mourad, M.M.H. Khalil, N.A. Abdel-Khalek, A. M. Elbendari, K.A. Selim, El-Sayed R.E. Hassan Rudarsko-geološko-naftni zbornik (**The Mining-Geology-Petroleum Engineering Bulletin**) accepted 18/1/2024 39 (2024) 101-114, DOI: 10.17794/rgn.2024.1.9 published 1/3/2024
9. Tinuvin-P metal complexes as new photo-stabilizers for PVC: Synthesis, characterization and DFT studies, Mohamed A. El Awady<sup>1</sup>, Mostafa M.H.Khalil, Gehad G, Mohamed, Abdel Naby M. Salem **Egyptian Journal of Chemistry** 67(7)127-139 (2024) (accepted 2/1/2024).
10. Colorant Tracking of Cyanide-toxin Compounds in Biological Cells via Branching Molecular Architectures. Islam M. El-Sewify, Mohamed A. Shenashen, Rasha F. El-Agamy, Mohammed S. Selim, Norah F. Alqahtani, Ahmed Elmarakbi, Mitsuhiro Ebara, Mahmoud M. Selim, Mostafa M.H.Khalil, Sherif A. El-Safty **Journal of Hazardous Materials** 465 (2024) 133271.
11. Magnetite-silica core-shell grafted myristic acid nanocomposites for oil adsorption from petroleum wastewater, Amira K. Ibrahim, Mahmoud F. Mubarak, Mohamed Keshawy, Yasser Mohamed Moustafa, Mostafa M.H.Khalil and Thanaa Abdel Moghny, **J. Dispersion Science and Technology**, 45(1), 129–139 (2024).
12. Functionalization of calcium silicate/sodium calcium silicate nanostructures with chitosan and chitosan/glutaraldehyde as novel nanocomposites for the efficient adsorption of Cd(II) and Cu(II) ions from aqueous solutions, Khaled Shafeeq · Samir M. El Rayes · Mostafa M.H.Khalil · Reem K. Shah, Fawaz A. Saad, Mohamed Khairy, Faisal K. Algethami · Ehab A. Abdelrahman **Silicon**, 16, 1713–1730, (2024) accepted 26/11/2023. <https://doi.org/10.1007/s12633-023-02793-w>
13. Modification of hydroxysodalite nanoparticles by (3-aminopropyl) trimethoxysilane and isatoic anhydride as a novel composite for efficient sorption of Cu(II) ions from aqueous media E. A. Abdelrahman, Mostafa M.H.Khalil, M. Khairy, Y. G. Abou El-Reash, H. M. Gad, H. A. Katouah,

- F. A. Saad, S. M. El Rayes, Khalil ur Rehman **Silicon**, 16, 1083–1096, (2024) (accepted 26/10/2023) <https://doi.org/10.1007/s12633-023-02743-6>.
14. Effect of weathering conditions on the durability of solar energy mirrors that heating the HTF oil in El-Kureimat solar energy power plant, Moshiera Badr, Ahmed A. I. Khalil, A. I. Hafez and E. M. Mostafa, **Mostafa M.H.Khalil**, **Int. J. of Power and Energy Conversion**. Vol. 15, No. 2, 2024 . Accepted 28/9/2023.
  15. Facile synthesis of MgO/CuO and MgO/Cu<sub>3</sub>MgO<sub>4</sub> binary nanocomposite as promising adsorbents for the disposal of Zn(II) ions, Ehab A. Abdelrahman, **Mostafa M.H.Khalil**, F. K. Algethami, M. Khairy, Y. G. Abou El-Reash, Fawaz A. Saad, Reem K. Shah, Alaa M. Ammar **Journal of Inorganic and Organometallic Polymers and Materials** 34, 266–281 (2024).  
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  16. Clarifying solvent effect during photocatalytic glycerol conversion on TiO<sub>2</sub> /GQD as selective photocatalyst, Sara Hassan, Dalia R. Abd El-Hafiz, E. S. Abdullah & **Mostafa M.H.Khalil**, **Scientific Reports** 13, 21820 (2023). <https://doi.org/10.1038/s41598-023-48781-3> accepted 30-11-2023. **PUBL.** 9-12-2023.
  17. Photodegradation of Antibacterial cefotaxime using Mn-doped ZnO nanospheres, A. M. Al-Garia, G.S. Elasal , Eman H. Ismail, **Mostafa M.H. Khalil**, Islam M. El-Sewify **Inorganic Chemistry Communications** 158 (2023) 111434.
  18. The simultaneous degradation of prochloraz and tebuconazole in water with monitoring their degradation products using liquid chromatography-tandem mass spectrometry. Awwad MM, Taha SM, **M. M.H.Khalil**, Salem AM, Chovelon JM, **Environmental Science and Pollution Research** 30, 83810–83820 (2023) accepted 10/6/2023, pub online - **June 23, 2023**
  19. *Antischistosomal effects of green and chemically synthesized silver nanoparticles: in vitro and in vivo murine model* Zeyad K. Hamdan, Soliman M. I., Taha H. A., **Mostafa M.H.Khalil** and Nigm A. M., **Acta Tropica**, 106952 (accepted 24/5/2023). **August 2023**,
  20. Enhanced oil spill remediation using environmentally asymmetric dicationic ionic liquids: synthesis, characterization, and evaluation Alharthy, Rima D., C. E. El Shafiee, M. I. Nessim, R. I. Abdallah, Y. M. Moustafa, M. Wafeek, D. A. Ismail, **Mostafa M.H.Khalil**, and R. A. El-Nagar, , **Carmen Elshafiee**, **Separations** 2023, 10, 397. (**Pub 25 May 2023**)  
<https://doi.org/10.3390/separations10070397> (publ. 10/7/2023)

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22. Preparation and characterization of rare earth elements for enhanced photocatalytic degradation, Rasha A. El-Kholy, Heba Isawi, Ehab Zaghloul, Elsayed A. Soliman, Mostafa M.H.Khalil, Moustafa M. Said, Abd-Ehameed M. El-Aassar **Environmental Science and Pollution Research** 30, 69514–69532 (2023) accepted 13/4/2023. <https://doi.org/10.1007/s11356-023-27090-2> (Pub May 2023)
  
23. Chitosan-based Fluorescence Amphiphile Macromolecular Sensor for Hg<sup>2+</sup> Detection Nariman M.H. El-Wakeel, Salah M. Tawfik, Ali A. Abd-Elaal, Y.M. Moustafa, Mostafa M.H.Khalil, **Journal of Molecular Liquids**, 380 (2023) 121744. accepted 26-3-2023. pub15 June 2023
  
24. Cinnamon Oil Encapsulated with Silica Nanoparticles: Chemical Characterization and Evaluation of Insecticidal Activity Against the Rice Moth, *Corcyra cephalonica* Radwa G. Attia · Mostafa M.H.Khalil · Mohamed A. Hussein1 · Hoda M. Abdel Fattah · Salwa A. Rizk Shireen A. M. Ma'moun **Neotropical Entomology** 52, 500–511 (2023). <https://doi.org/10.1007/s13744-023-01037-1> (pub 13/3/2023)
  
25. Exceptional Long-Term Stability of Titanium Oxynitride Nanoparticles as Non-Carbon Based Electrodes for Aerated Saline Water Capacitive Deionization, Manar M. Taha, Mohamed Ramadan, Ali Abdelhafiz, Mostafa Y. Nassar , Shreen S. Ahmed, Mostafa M.H.Khalil and Nageh K. Allam, **Desalination**, Volume 546, 15 January 2023, 116219.
  
26. **Using** the poly-lactic acid as a fuel additive to enhance the physicochemical properties of aircraft jet fuel grade A1. Zalat, A. M., Mansour, E. S. M. E., Hewehy, M. A. I., & Khalil, M. M. H. **International Journal of Health Sciences**, 7(S1), (2023) 2158–2171. <https://doi.org/10.53730/ijhs.v7nS1.14446>
  
27. Prediction of inhalation health risk of mercury emissions from stacks of cement plant employing coal as an alternative fuel. Mustafa, A. S., Hewehy, M. A., Khalil, M. M. H., & Zaki, G. R. (2023). **International Journal of Health Sciences**, 7(S1), 1447–1467. <https://doi.org/10.53730/ijhs.v7nS1.14296>
  
28. Novel Nano-Sorbents Modified QuEChERS combined with GC-MS/MS for determination of pesticide residues used against *Spodoptera littoralis* in foodstuff, Eman Essa, Sayed, Maryam Mohamed, Hamzawy, Ahmed H,

Khalil, Mostafa M.H., Rady, Magda H. *Egyptian Journal of Chemistry*, Vol. 66(4), 361-369 (2023). doi: [10.21608/ejchem.2022.150453.6533](https://doi.org/10.21608/ejchem.2022.150453.6533).

29. Characterization and evaluation of multiple biological activities of phytosynthesized gold nanoparticles using aqueous extract of *Euphorbia dendroides* HI Abd El-Moaty, EH Ismail, R Abu-Khudir, NA Soliman, D. Y. Sabry, N. K. Al Abdulsalam<sup>1</sup>, W. A. Sorour, and Mostafa M.H.Khalil ... - *Nanomaterials and Nanotechnology*, 12, (2022), 1-17.
30. The Antibacterial Activity of Egyptian Wasp Chitosan-Based Nanoparticles against Important Antibiotic-Resistant Pathogens Eman E Essa, Dalia Hamza, Mostafa M.H.Khalil, Hala Zaher, Dina Salah, Ashwaq M Alnemari, Magda H Rady, Shimaa AA Momen *Molecules* 27(21),(2022) 7189.
31. High performance Ni nanoparticles@graphene oxide-crosslinked poly(vinyl alcohol) free-standing film for catalytic applications reductive and oxidative reactions, Ossama I. Metwalli, Wael Eisa, Badawi Anis, Abdel Naby M. Salem, Ahmed S.G. Khalil, Mostafa M.H.Khalil. *Journal of Material Research & Technology*, 20, 1142-1156 (2022).
13. Influence of Polymers on the grinding and rheology of ultrafine Egyptian Calcium carbonate suspension, Sabreen Mourad, Mostafa M.H.Khalil, Nagui Abdel-Khalek, Mohamed Abdel-Khalek, Khaled Selim, El-Sayed Hassan, *Physicochemical Problems of Mineral Processing*, 58(6), 2022, 152163  
DOI: <https://doi.org/10.37190/ppmp/152163>
33. Groundwater Quality Assessment Using Water Quality Index and Multivariate Statistical Analysis Case Study: East Matrouh, Northwestern Coast, Egypt, Rasha A. El-Kholy, Ehab Zaghlool, Heba Isawi, Elsayed A. Soliman, Mostafa M.H.Khalil, Abdel-hameed M. El-Aassar & Moustafa M. Said *Environmental Science and Pollution Research*, 29, 65699–65722 (2022). (accepted 13/3/22 published 30/4/22)  
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34. Polycyclic aromatic hydrocarbons (PAHs) in Greater Cairo water supply systems Mahmoud M. Fouad; Ahmed S. El-Gendy; Mostafa M.H.Khalil; Taha M. A. Razek, *Journal of Water and Health* (2022) 20 (4): 680–691 doi: 10.2166/wh.2022.312 (accepted 12/4/2022)

35. Equilibrium Kinetic and Thermodynamics Studies of Uranium Adsorption by Natural Clinoptilolite from Acidic Medium, Hager Nasser El Shamy, Mostafa M.H.Khalil, Mohamed Shaaban Atrees, El Sayed Ali Haggag, Mohamed Ismaiel Mahmoud El Aoady, Amira Mohamed Tawfik and Hend Abdelkhalik Salem2 *Egyptian Journal of Chemistry*, 65(7) (2022) 121 – 129 (DOI: [10.21608/ejchem.2021.98150.4573](https://doi.org/10.21608/ejchem.2021.98150.4573) )
  
36. Green Synthesis of Silver Nanoparticles using Egyptian Propolis Extract and its Antimicrobial Activity, Samir Osman. Mohamed, Karim El-Naggar, Mostafa M.H.Khalil *Egyptian Journal of Chemistry*, 65,.( 7), 453 – 464 (2022) (DOI: [10.21608/ejchem.2021.104296.4838](https://doi.org/10.21608/ejchem.2021.104296.4838))
  
37. Superior Adsorption and Removal of Aquaculture and Bio-Staining Dye from Industrial Wastewater Using Microporous Nanocubic Zn-MOFs accepted Islam M. El-Sewify, Ahmed Radwan, Ahmed Shahat, M.F. El-Shahat, Mostafa M.H.Khalil *Microporous and Mesoporous Materials* 329 (2022) 111506 14/10/2021, published 2/11/2021.
  
38. Optimal Design of Silver@Silver Sulfide-Modified WS2 and Its Application in Photocatalytic Diclofenac Degradation and H2 Generation" EmanTorad, Eman H.Ismail, Mohamed Mokhtar Mohamed, Mostafa M.H.Khalil accepted for publication in *Journal of Environmental Chemical Engineering* 9, (2021), 106446 (23/9/2021) pub 12/2021.
  
39. Synthesis of Pure and Doped SnO<sub>2</sub> and NiO Nanoparticles and Evaluation of their Photocatalytic Activity A.Asem, W.Abdelhaleem, F.F.Hammad, Mostafa M.H. Khalil and H.K.Farag *Materials Chemistry and Physics* 275 (2022) 125190 (pub:22/9/2021)
  
40. Macro and nano oligomers ternary metal complexes preparation, structural elucidation: antimicrobial, anticancer activities and mechanistic study of Cu nanocomplexes on liver carcinoma *Applied Organometallic Chemistry* (2021), 35(11), e6392. <https://doi.org/10.1002/aoc.6392> (accepted 14/7/2021) pub 20/10/2021
  
41. Aluminum sulfate regeneration from surface water treatment waste in Cairo, Egypt. Mahmoud Mohamed Fouad Hussein, Mostafa M.H. Khalil, Ahmed S El-Gendy *Environmental Science and Pollution Research*, (2021) 28:61450–61459 (accepted 22/6/2021) . pub on line 2021 Jun 26. doi: 10.1007/s11356-021-15140-6. (pub:28/11/2021.
  
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المشاريع التي تم تحكيمها

Project title: Improvement of tin and copper tin sulphide compounds by antimony addition for photo electrochemical solar cell applications