

# SCIENTIFIC ACTIVITY REPORT

## PERSONAL INFORMATION

**Name:** Muhammed

**Surname:** Alkali

**Nationality:** Nigerian

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## UNIVERSITY STUDIES

### Undergraduate studies

University	<b>USMANU DANFODIYO UNIVERSITY, SOKOTO. NIGERIA.</b>
Faculty	<b>SCIENCES</b>
Department	<b>PURE AND APPLIED CHEMISTRY</b>
Unit	<b>PURE CHEMISTRY</b>
Year of graduation	<b>2013</b>
Title of undergraduate project	<b>Determination of the cyanide contents of different root crops grown in Sokoto state, Nigeria.</b>
Cumulative Grade Point Average (CGPA)	<b>4.33/5.00</b>

### Master's degree studies

University	<b>MANGALORE UNIVERSITY, KARNATAKA, INDIA.</b>
Faculty	<b>SCIENCES</b>
Department	<b>CHEMISTRY</b>
Title of master's degree	<b>MSc Chemistry</b>
Year of graduation	<b>2018</b>
Title of master's dissertation	<b>Verification of Pharmacopeia Assay by HPLC test method for Methylprednisolone Hydrogen Succinate (drug substance).</b>
Grade awarded	<b>A</b>

#### Doctoral studies

University	<b>UNIVERSITY OF BUCHAREST</b>
Faculty	<b>CHEMISTRY</b>
Doctoral School	<b>DOCTORAL SCHOOL IN CHEMISTRY</b>
Domain	<b>CHEMISTRY</b>
Period	<b>FEBRUARY 2022 - PRESENT</b>
Title of the doctoral thesis	<b>Emissive liquid crystalline materials based on d<sup>10</sup> metal complexes.</b>

#### **PROFESSIONAL EXPERIENCE**

Name of employer	<b>RESEARCH CENTRE FOR THEORETICAL AND APPLIED INORGANIC CHEMISTRY, UNIVERSITY OF BUCHAREST</b>
Period	<b>JULY 2023 - PRESENT</b>
Position occupied	<b>UNIVERSITY RESEARCH ASSISTANT</b>
Activities and responsibilities	<ul style="list-style-type: none"><li>• <b>Synthesis, structural and mesomorphic characterization of liquid crystalline compounds.</b></li><li>• <b>Study of photophysical properties via UV absorption and emission.</b></li></ul>

Name of employer	<b>INSTITUTE OF PHYSICAL CHEMISTRY – ILIE MURGULESCU OF THE ROMANIAN ACADEMY</b>
Period	<b>JANUARY 2025 - PRESENT</b>
Position occupied	<b>RESEARCH ASSISTANT</b>
Activities and responsibilities	<ul style="list-style-type: none"><li>• <b>Design, synthesis and structural characterization of Free radicals.</b></li><li>• <b>Study of Host-Guest interaction of the radicals with cyclodextrins and Cucurbiturils using ESR spectroscopy.</b></li></ul>

Name of employer	<b>FEDERAL UNIVERSITY BIRNIN KEBBI</b>
Period	<b>SEPTEMBER, 2018 – SEPTEMBER, 2021</b>
Position occupied	<b>ASSISTANT LECTURER</b>
Activities and responsibilities	<ul style="list-style-type: none"> <li>• <b>Teaching and evaluation of undergraduate students.</b></li> <li>• <b>Supervision and conduct of general chemistry research.</b></li> </ul>

### **LIST OF SCIENTIFIC PAPERS – ISI JOURNALS (Relevant to the Doctoral thesis)**

1. **Alkali, M.**, Iliş, M., Popescu, R. G., Marinescu, G. C., & Cîrcu, V. (2025). Mechanochromic and stimuli-dependent emission of luminescent liquid crystals based on copper(I) complexes with benzoyl thiourea derivatives. *Inorganic Chemistry Communications*, 182, 115364.
2. **Alkali, M.**, Micutz, M., Iliş, M., Ganea, C. P., Rădulescu, M., & Cîrcu, V. (2025). Dielectric and rheological characterization of physical gels based on liquid crystals mixture E7 and thiourea low molecular weight gelators. *U.P.B. Scientific Bulletin, Series A: Applied Mathematics and Physics*, 87(3), 175–190. Politehnica University of Bucharest.
3. **Alkali, M.**, Iliş, M., Micutz, M., Pasuk, I., Gabriela Popescu, R., Cătălin Marinescu, G., & Cîrcu, V. (2024). Design of novel copper(I) metallomesogens with benzoylthiourea ligands having peripherally connected cyano or fluoro groups. *Journal of Molecular Liquids*, 414, 126112.
4. **Alkali, M.**, & Cîrcu, V. (2023). Perspectives on the Structural Design and Luminescent Behavior of Liquid Crystalline Materials Based on Copper(I) Complexes. *Chemistry*, 5(1), 646-661.

### **LIST OF SCIENTIFIC PAPERS (Other research activities)**

1. Usman, F., & **Alkali, M.** (2024). Preparation and characterization of bentonite clay catalysts for transesterification of waste cooking oil into biodiesel. *Fudma Journal of Sciences*, 8(2), 204–211.
2. Haruna, S. Y., **Alkali, M.**, Isah, A. M., Garba, A. A., Magaji, B., & Zubairu, M. S. (2023). Phytochemical constituents & physicochemical properties of medicinal plant (*Euphorbia hirta*) leaves. *International Journal of Modern Chemistry*, 15(1), 30–41.
3. Abba, A., **Alkali, M.**, Umar, K. J., Hassan, L. G., Yakubu, M. K., & Umar, M. F. (2022). Characterization of alkyd resins prepared from okra seeds oil with two polybasic acids. *Equity Journal of Science and Technology*, 9(2), 34–42. Kebbi State University of Science and Technology.

4. Yahaya, T., **Alkali, M.**, Onyeziri, J. A., Abdulazeez, A., Shemshere, U., Bakare, T., Kalgo, B., & Yusha'u, Y. (2022). Health risks of ecosystem services in Ologe Lagoon, Lagos, Southwest Nigeria. *Pollution*, 8(2), 681–692. University of Tehran Press.
5. Yahaya, T., Abdulganiyu, Y., **Alkali, M.**, Obi, M., Ukpere, M., Ayodeji, S. O., & Ahmadu, A. I. (2022). Occurrence and health risk of heavy metals and microorganisms in wastewater collected from selected eateries in Lekki, Lagos, Nigeria. *Nigerian Journal of Environmental Sciences and Technology (NIJEST)*, 6(1), 38–46.
6. Umar, M. T., Musah, M., Ibrahim, I. L., Abdulkarim, A., Paiko, M. A., & **Alkali, M.** (2021). Preliminary studies on biofuel potentials of shea nut cakes in Niger State, Nigeria. *CaJoST*, 3(1), 76–82.
7. Umar, M. T., Musah, M., Ibrahim, I. L., Yakubu, A., Aliyu-Paiko, M., & **Alkali, M.** (2020). The effects of temperature and catalyst concentration on transesterification of oil extracted from Ceiba pentandra (silk cotton) seed oil. *International Journal of Science for Global Sustainability*, 6(3), 143–150. Federal University Gusau.
8. Yaradua, A. I., **Alkali, M.**, Alhassan, A. J., Atiku, M. K., Wudil, M. A., Matazu, K. I., Nasir, A., Suleiman, Z. A., Usman, F., Shuaibu, L., Idi, A., Muhammad, I. U., Bello, Y. K., Sule, S., & Yaradua, A. A. (2020). Determinants and prevalence of metabolic syndrome in subjects attending the General Outpatient Department of the Federal Medical Centre Katsina State, North West Nigeria. *Asian Journal of Biochemistry, Genetics and Molecular Biology*, 5(1), 28–37.
9. Yaradua, A. I., **Alkali, M.**, Alhassan, A. J., Imam, A. A., Nasir, A., Usman, F., Shuaibu, L., Idi, L., Muhammad, I. U., & Bello, Y. K. (2019). A comparative evaluation of the heavy metals content of sorghum cultivated in Katsina State, North West Nigeria. *ACTA Scientific Nutritional Health*, 3(11), Article ISSN: 2582-1423.
10. Bungudu, J. I., Shuaibu, L., Mohammed, U. F., & **Alkali, M.** (2018). Heavy metals analysis in human body (toenail, fingernail and hair samples) and drinking waters of Santa Fe Region, Argentina. *Asian Journal of Applied Chemical Research*, 2, 1–14.

#### **PRESENTATIONS AT NATIONAL AND INTERNATIONAL SCIENTIFIC CONFERENCES.**

1. **Alkali, M., et al.** “Gelation and doping properties of benzoyl thiourea derivatives” *Oral presentation, International Symposium “Chiral Molecules and Organic Radicals”*, Romanian Academy, June 30 – July 1, 2025.
2. **Alkali, M., et al.** “Study of ionic liquid crystals based on Cu(I) complexes with benzoyl thiourea” *Oral presentation, 8th International Colloquium “Physics of Materials” (PM-8)*, Bucharest, Romania, 14–15 November 2024.
3. **Alkali, M., et al.** “Design of emissive liquid crystals based on Copper(I) complexes with benzoyl thiourea, having a cyano or fluoro group peripherally connected”

*Oral presentation, Second Symposium for Young Chemists: Innovation and Sustainability (SYNC 2024), Rome, Italy, 24–28 June 2024.*

4. **Alkali, M., et al.** “Design of novel liquid crystalline compounds with N-benzoyl thiourea derivatives with fluoro or cyano peripheral groups” *Oral presentation, Workshop “Conferința tinerilor cercetători din școlile de chimie bucureștene”*, Romanian Academy, 17 April, 2024.
5. **Alkali, M., et al.** “Study of liquid crystals based on ionic Cu(I) complexes with benzoyl thiourea” *Oral presentation, 7th International Ankara Multidisciplinary Studies Congress*, Ankara, Turkey, 5–6 March 2024.
6. **Alkali, M., et al.** “Design of liquid crystals of copper(I) complexes from benzoyl thiourea ligands” *Oral presentation, Exploratory Workshop “Innovative Cross-Sectoral Technologies” (NeXT-Chem), 5th Edition*, Bucharest, Romania. 22–23 May 2023.
7. **Alkali, M., & Circu, V.** “Copper(I) Metallomesogens with Schiff base ligands” *Poster presentation, International Colloquium "Physics of Materials" (PM-7)*, University POLITEHNICA of Bucharest, Romania. 10-11 Nov. 2022.

#### **INTERNSHIPS/COURSES/SCHOLARSHIPS/ERASMUS MOBILITY**

<b>Type of activity (internship/course/scholarship)</b>	<b>Period</b>	<b>Institution where the internship/course/scholarship took place)</b>
International Summer School on Nanoscience & Nanotechnologies NANOSUM 2024	03/05/2024 - 30/07/2024	Eberhard Karls Universität Tübingen, Germany.
Internship	01/04/2025 – 30/04/2025	Institute of Radical Chemistry - Aix Marseille Université, France.

#### **AWARDS**

1. **Romanian Ministry of Foreign Affairs Scholarship** – October 2021  
Awarded a scholarship to pursue a PhD degree in Chemistry at the University of Bucharest, Romania.
2. **King Fahad University of Petroleum and Minerals MSc Fellowship** – January 2017  
Awarded a scholarship to pursue a Master’s degree in Petroleum Chemistry at King Fahad University of Petroleum and Minerals, Saudi Arabia.

3. **Indian Centre for Cultural Relations (ICCR) Scholarship** – August 2016  
Awarded a scholarship by the Government of India to pursue a Master's degree in Chemistry at Mangalore University, India.

Date: 25/10/2025

Signature:

A handwritten signature in black ink, consisting of a large, stylized capital 'A' followed by several loops and a final flourish.