**CURRICULUM VITAE**

**PERSONAL**

Name : Kamal Aziz **Ketuly**

Place of Birth: Baghdad

Telephone: 009647504514116 & 00447459747989

Email: kketuly@hotmail.com

Languages: Kurdish, Arabic and English (Reading & Writing)

**UNIVERSITY EDUCATION**

University of Glasgow - Chemistry Department, 1976-82 Scotland - UK

**Ph.D. Degree awarded in 1982**

Thesis on „Analytical and Synthetic Studies of Boronic Acids and their Derivatives‟.Studies supported by a studentship from Glasgow University.

**Master of Applied Science 1976-78**

The main course was in Polymer (theoretical & practical applications) Science, Spectroscopy (IR, UV, NMR, Microwave, X-Ray, Crystallography Electron Microscopy), Geochemistry, Agricultural Chemistry (including Atomic Absorption), Inorganic & Organic Chemistry, Chromatography Techniques of GLC & GC-MS. Surface Chemistry (Catalysis), Computer Sciences (soft and hard ware).Two projects in “ Preparation of Some Less Commonly Available Cholesterols for Use in Sterol Analysis by GLC & GC-MS” (Retention and MS Correlations).

University of Baghdad - College of Sciences, 1972-1976 Baghdad - Iraq

**B.Sc. (Hons.) Degree in Industrial Chemistry**

Industrial Polymer Chemistry, Analytical Chemistry, Organic Chemistry, Inorganic Chemistry, Physical Chemistry, Food Chemistry, Industrial Chemistry, Nuclear Chemistry, Mineralogy, Chemistry, Zoology, Botany, Geology, Physics, Mathematics, Programming & Computer Science.

**EMPLOYMENT**

**Professor** at Department of Medical Chemistry, College of Medicine, University of Duhok (UoD), Duhok – Iraq. March 2012 to present.

**Full time Associate Professor/Senior Research Fellow** at the Chemistry Department – Faculty of Science – University of Malaya – Kuala Lumpur - Malaysia. January 1997- June 2002 **&** March2009 - Feb. 2012.

**Visiting Professor University of Duhok, Kurdistan Region/Iraq,** 2007-2009.

**Representative of Kurdistan Regional Government - Iraq for the Far East Mission based in Malaysia,**  December 2003 – 2007.

**Head of Research and Development in Hydrocarbons Analysis.** Singapore, July 2002 –November 2003.

**Independent Research Consultant in UK,** May 1992-August 1996

During this period I worked independently in the field of Research and Consultancy. The period of work for each contract was dependant on the Company and my agreement with them. The main areas were in Resin Chemistry, Marine Oils and Biochemical Analytical Applications.

**Postdoctoral Research Fellow,** Chemistry Department – University of Glasgow**,** 1982-1990

In addition to my Ph.D. studies and my Post doctorate research I have experienced substantial teaching duties to undergraduate students in Organic Chemistry 1st year; Organic, Physical and Biological Chemistry to the 2nd year, Tutorials for the 1st and 2nd years; Organic Chemistry 3rd year and also Surface and inorganic Chemistry for 4th years.

I have designed and taught with Professor Charles Brooks (one of the first pioneers in GC & GC-MS), the new analytical experiments and Microderivatisation reactions for the Chromatography Technique Course to the final year honours students. Then I have introduced in 1986 and for the first time HPLC analytical experiments and theories to this course. I have also acted as a Co-supervisor for the Postgraduate students.

**Business Course (NEP) at the Management Studies Department, Glasgow University**

September-December 1984.

**AWARDS**

- Reviewer Certificate from British Journal of Medicine and Medical Research awarded on 8th April 2016.

- The Glasgow City Chambers Plaque on 30th March 1993 in honour and recognition of my services to the Community.

**PATENTS**

1- The Patent application entitled „Stationary Phases for Gas Chromatography‟ with patent No. PCT/SGO2/00062. This technology was marketed under the brand name “**AMPAK”**. This is the first time in recorded scientific technology that a packed chromatographic column has been invented to separate the components (hydrocarbons and permanent gases) of the petroleum gas and liquid phase mixture in one run/one injection. “**AMPAK”** Surface area: 500m2/g ; pore volume: 0.75cm3/g ; pore diameter: 60Å. Used for separating light, medium, heavy hydrocarbons C1-C44 range (with order of elution). It‟s unique bonded chemical structures, surface area and porosity could separate saturates, un-saturates , cyclic and aromatics petroleum hydrocarbons and including H2,N2& CO2 from above ambient temperature and up to 400oC. Stable baseline and no bleed, all through the analysis with reproducible results. Highly stable towards sulfur or amine containing compounds. These packed stainless steel columns should nearly fit all the GC ovens. High affinity for alcohols and water. This invention has been applied successfully for the analytical separation of petroleum hydrocarbons and permanent gases by Gas Chromatographic (GC) techniques (Appendix II). I could see the future possibilities for the application of this technology for the Large Scale Production in the separation of Petroleum Hydrocarbons. This could be achieved by designing a Pilot Plant with R&D for the Production Scale Gas Chromatographic process for hydrocarbons separations.

2- Proton Polymer Based Battery, The Malaysia Patent Application Number: PI 2010002385.

**MEMBERSHIP OF PROFESSIONAL ORGANISATIONS AND SOCIETIES**

- International Association of Therapeutic Drug Monitoring and Clinical Toxicology ( IATDMCT ).

- PASCAL International Observatory, connecting Education Institutions and Learning Cities

**REFEREES**

Professor Dr. Dhia Al Timimi, Head of Department of Biochemistry, Faculty of Medicine, University of Duhok, Duhok, Kurdistan Region – Iraq. Tel. 009647504228908, E-mail: altmimidj@yahoo.com

Professor David D. MacNicol, Project Adviser, Chemistry Department, University of GlasgowGlasgow G12 8QQ, Scotland U.K. Scotland U.K. Tel: 0044-141-330 5289, Fax: 0044-141-330 4888 E-mail: davemcn@chem.gla.ac.uk

Prof Francis Johnson, Dept of Pharmacological Sciences, School of Medicine, Graduate Chemistry Bldg, Room 607 50603, State University of New York Stony Brook, New York, 11794 3400, U.S.A. Tel: 516 632 8866 Fax: 0516-632 7394. E-mail: francis@pharm.stonybrook.edu

**PUBLICATIONS**

**ISI Index Publications**

1. **Analysis and characterisation of oxygenated sterols by capillary gas chromatography-mass spectrometry;** C.J.W. Brooks, J. MacLachlan, W.J. Cole and K.A. Ketuly, *Biological activities of oxygenated sterols,* J.P. Beck, A. Crasters de Paulet, Eds. *Colloque*INSERM, 1988, **166**, 1988,13-14.
2. **Chromatographic and mass spectrometric studies of cyclic (2-Dimethylamino-methyl) ferroceneboronates and related esters;** KeijiGamoh, K.A. Ketuly, W.J. Cole and C.J.W. Brooks. *Analytical Sciences,* 1994, **10**, No.**5,** 705-771.
3. **(20S)-6**β**-Methoxy-20-(p-toluene sulfonyloxymethyl)-3 -5-cyclo-5 –pregnane;** K.A. Ketuly, D.S. Yyufit, C.J.W. Brooks and A.A. Freer,*Acta.Cryst*. 1997, **C53**, 981-982.
4. **Heavy molecular-weight organic compounds in the atmosphere: the hopanes;** Nasir Yousef M.J. Omar, M. Radzi Bin Abas, Kamal Aziz Ketuly and NorhayatiMohd. Tahir. *Malaysian Journal of Analytical Sciences,* 2001, **7(1)**, 203-208.
5. **Characterization of solvent-extractable hydrocarbons in airborne and roadside soil particles of Kuala Lumpur, Malaysia;** Nasir Yousef M.J. Omar, M. Radzi Bin Abas, Kamal Aziz Ketuly and NorhayatiMohd. Tahir. *Malaysian Journal of Science*, 2002, **21**,171-178.
6. **The concentrations of PAHs in atmospheric paricles (PM 10) and roadside soil**

**particles collected in Kuala Lumpur, Malaysia;** Nasir Yousef M.J. Omar, M. Radzi BinAbas, Kamal Aziz Ketuly and NorhayatiMohd. Tahir. *Atmos. Environ****.,*** 2002, **36(2)**, 247-254.

1. **(20R,24R,25S)-3aα7α,12α,27-Tetraacetoxy-24,26-epoxy-5β-cholestane**; Kamal Aziz Ketuly, A. Hamid A. Hadi and SeikWeng Ng.*ActaCryst.*2009,**E65,** o1026.
2. **(20*R*)-24-Bromo-5α-cholane**; Kamal Aziz Ketuly, A. Hamid A. Hadi and SeikWeng Ng.*ActaCryst.*2009, **E65,** o1124.
3. **(20S)-22-Iodomethyl-6β-methoxy-3α,5-dihydro-30H-cyclopropa[3α,5]-5α-pregnane;** Kamal Aziz Ketuly, A. Hamid A. Hadi and SeikWeng Ng. *ActaCryst.*2009, **E65,** o1125.
4. **3-Iodo-8β,9α,14α-estra-1,3,5(10)-trien-17-one;** Kamal Aziz Ketuly, A. Hamid Hadi and SeikWeng Ng. *ActaCryst.* 2009, **E65,** o1195.
5. **(20S)-22-Acetoxymethyl-6β-methoxy-3α,5-dihydro-30H-cyclopropa [3α ,5]-5α-**

**pregnane;** Kamal Aziz Ketuly, A. Hamid A. Hadi and SeikWeng Ng. *ActaCryst.*2009, **E65,** o1486.

1. **9α-Bromo analog of beclometasonedipropionate monohydrate;** Kamal Aziz Ketuly, A. Hamid A. Hadi and SeikWengNg.*ActaCryst.* 2009, **E65,** o1821.
2. **2-Bromobeclometasone dipropionate;** Kamal Aziz Ketuly, A. Hamid A. Hadi and SeikWeng Ng.*ActaCryst.*2009, **E65,** o1822.
3. **(8S,9R,10S,11S,13S,14S,16S,17R)-4,4-Dichloro-16β-methyl-3,20-dioxo-17,21**

**bis(propanoyloxy)-5β,8β-epoxypregna-1,9-diene;** Kamal Aziz Ketuly, A. Hamid A. Hadi and SeikWeng Ng.*ActaCryst.*2009, **E65,** o2220.

1. **Boronate Derivatives of Functionally Diverse Catechols: Stability Studies;** Kamal Aziz Ketuly and A. Hamid A. Hadi. *Molecules,* 2010, **15**, 234 -2356.
2. **5,22-Stigmastadien-3β-ol*p*-toluenesulfonate;** Kamal Aziz Ketuly, A. Hamid A. Hadi, Hamid Khaledi and Edward R. T. Tiekink.*ActaCryst.*2010, **E66,** o1336.
3. **3-Methyl-5α-cholest-2-ene;** Kamal Aziz Ketuly, A. Hamid A. Hadi, SeikWeng Ng and Edward R. T. Tiekink. *ActaCryst.*2010, **E66,** o2265.
4. **Anti-ulcer activity of the 9alpha-bromo analogue of *Beclomethasonedipropionate* Against ethanol-induced gastric mucosal injury in rats**; Kamal A. Ketuly, Mahmood A.Abdulla, Hamid A. Hadi, Abdalbasit A. Mariod and Siddig Ibrahim Abdel-Wahab.*J. Med. Plants Res.* 2011, **5**(4), 514-520.
5. **3β-Acetoxy-6-hydroxyiminocholestane;** Kamal Aziz Ketuly, A. Hamid A. Hadi, SeikWeng Ng and Edward R. T. Tiekink. *ActaCryst.*2011, **E67,** o773-o774.
6. **Chisomicines A-C, Limonoids from *Chisochetonceramicus***; Ibrahim A. Najmuldeen, A. Hamid A. Hadi, KhalijahAwang, Khalit Mohamad, Kamal Aziz , Ketuly, Mat RopiMukhtar, Soon-Lim Chong, Gomathi Chan, MohdAzlanNafiah, Ng SeikWeng, Osamu Shirota, Takahiro Hosoya, Alfarius E. Nugroho, and Hiroshi Morita.*J. Nat. Prod.*2011, **74** (5), 1313-1317.
7. **17-Deoxoestrone [estra-1,3,5(10)-trien-3-ol]-methanol (3/1)**; Kamal Aziz Ketuly, A. Hamid A. Hadi, SeikWeng Ng and Edward R. T. Tiekink. *ActaCryst.*2011, **E67,** 01160-01161.
8. **Acute toxicity study and wound healing potential of *Gymuraprocumbens*leaf extract in Rats**; A. A. Zahra, F. A. Kadir, A. A. Mahmood, A. A. Hadi, S. M. Suzy, S. Z. Sabri, I. I. Latif, and K. A. Ketuly.*J. Med. Plants Res.* 2011, **5**(12), 2551-2558.
9. **Steroids from Chisochetontomentosus;** Najmuldeen, I.A. , Hadi, A.H.A., Mohamad, K., Awang, K., Nasab, M.F., Ketuly, K.A., Mukhtar, M.R., Morita, H., *Mal. J. Sci*. 2011, **30** (2), 144-153.
10. **2-(4-Chlorophenyl)-3,5-dimethyl-1λ,2-thiazine-1,1-dione**; Rostam R. Braim, Kamal Aziz Ketuly, A. Hamid A. Hadi and Hamid Khaledi.*ActaCryst.*2011, **E67,**o2775.
11. **Production of Biocellulosic Ethanol from Wheat Straw**; Ismail, W. Ali, Braim, R. Rasul, Ketuly, K. Aziz, AwangBujag, D. SitiShamsiah and Arifin, zainudin.*Acta Polytechnica,*2012*,* **52(3),** 28-34.
12. **Acute Toxicity and Gastroprotection Studies with a Newly Synthesised Steroid;** Kamal A. Ketuly, A. Hamid A. Hadi, ShahramGolbabapour, Maryam Hajrezaie, PouyaHassandarwish, HapipahMhd. Ali, Nazia Abdul Majed and Mahmood A.Abdulla. *PLoS One*, 2013, **8**(3), e59296.
13. **Engineering robust polar chiral clathrate crystals;** Christopher S. Frampton, Kamal A. Ketuly, A. Hamid A. Hadi, James H. Gall and David D. MacNicol. *Chem. Com* 2013, **49**. 7198 - 7200.
14. **Gastroprotective effect of desmosdumotinC isolated from Mitrellakentii againstethanol induced gastric mucosal hemorrhage in rats: possible involvement of glutathione,heat-shock protein-70, sulfhydryl compounds,** nitric**oxide, and anti-Helicobacter pylori activity**; Heyam M. A. Sidahmed, Ainnul H. S.Azizan, Syam Mohan,Mahmood A.Abdulla, Siddig I.Abdelwahab, Manal M. E.Taha, A Hamid A. Hadi, Kamal A.Ketuly, Najihah M.Hashim, Mun Fai Loke

And Jamuna Vadivelu. *BMC Complementary and Altern Med.*2013,**13**:183-198.

1. **Phytosterols and Phytostanols in Palm Oils**. Kamal A. Ketuly, ,*Duhok Med. J*., 2013, **7**(1), 65- 80.
2. **Bioethanol Production from Acid Hydrolysates of Date Palm Fronds Using a Co-culture of Saccharomyces cerevisiae and Pichiastipitis**; Ismail W. Ali1, Ketuly K. Aziz, Azizan A. H. Syahadah, Kelvin S.C.W., Arifin Z., *Int. J. Enhan. Res. Sci. Tech. & Eng*.,2014, **3**(5), 35-44.
3. **A study on the spectroscopic, energy band, and optoelectronic properties of α,ω- dihydroxylsexithiophene/trist(8-hydroxyquinolinate) gallium blends, DH6T/Gaq3 composite system;** Fahmi F. Muhammad, MohdYazidYahya, Kamal Aziz Ketuly, AbdulkaderJaleel Muhammad, KhaulahSulaiman, *SpectrochimicaActa Part A: Mol. & Biomol. Spect.*, 2016, **169**, 144-151
4. **An unprecedented Dianin clathrate structure with *Z* ′ (host) = 16;** Christopher S. Frampton, Kamal K. Ketuly, Hapipah B. M. Ali, Ainnul H. S. Azizan, James H. Gall and David D. MacNicol, *CrystEngComm,*2017, **19**, 2653-2659.
5. **Effect of Thermal Annealing on a Ternary Organic Solar Cell Incorporating Gaq3 Organometallic as a Boosting Acceptor,** Fahmi F. Muhammad, Kamal Aziz Ketuly, Mohd Y. Yahya, *J Inorg Organomet Polym*, 2018, **28** (1), 102 - 109.

**A. Proceedings**

- AzizahMainal, RauzahHashim and Kamal Aziz Ketuly, 1999, *Computer Aided Design and Molecular Modeling Carbohydrate Liquid Crystal*. Proceeding of the Malaysian Science andTechnology Congress Symposium C , New Materials and Information Technology.

**APPENDIX I**

**Academic Lectureships** in the following subjects:

**Ph.D. Courses in Advance Biochemistry & Instrumentations and Laboratory Techniques.** Department of Medical Chemistry, College of Med., UoD:

- Advanced Bio-organic Medical Chemistry & biochemistry

- Instrumentation and Labs Techniques in Clinical Biochemistry.

**M.Sc. Courses in Clinical Biochemistry and Analytical Instrumentation, Department of** Medical Chemistry, College of.Med.UoD:

- Clinical Biochemistry, Analytical Techniques and Instrumentation.

- Biomolecules, Disease and Clinical Diagnoses.

- Biosensors and Nanobiosensors.

- Separating the Analyte from Interferents.

- The Principles & Applications of Chromatographic Systems (GC & HPLC), Analysis, Techniques & Applications in Medicinal Science (Theoretical & Practical Course).

**Undergraduate Medical Courses**:

Biochemistry, Organic Chemistry, Biosynthesis, Lipids, Carbohydrates, Proteins,

Spectrometry: NMR, MS, IR & UV; Separation and Identification Methods in Science,

Chromatographic systems and Application in Medicinal Science

**Academic activities**

- Supervision and Co-Supervision of the M.Sc. and Ph.D. students at Universities of Glasgow, Malaya and Duhok.

- Advisor for the Postgraduate students

- Responsibility for the final year Organic Laboratory

- Responsibility of the GLC, HPLC, GC-MS and the LC-MS laboratories

**Academic collaborations:**

Research collaboration between CENAR - University of Malaya & Glasgow University

Formal MOA for Research collaborations between CENAR Centre, University of Malaya (UM) and the Chemistry Department, Glasgow University (GU) – Scotland has been signed on March 2011. The areas of collaborations will be including the synthesis of novel anti-bacterial, anti-viral compounds and chiral recemic mixture and the separations of their enantiomers. This collaboration will be with Professor David D. MacNicol and Mr. James Gall at (GU) and Dato Professor A. Hamid A. Hadi and Dr. Kamal Ketuly at (UM). The collaborations will include analytical, separation and purification of the promising lead compound(s). These isolated compounds will be tested for their biological activity and specifically against the mutant strains of tuberculosis. Such studies will be targeted at high-profile publications in leading scientific journals.

Karolinska Institute, Stockholm – Sweden, June 1984-September 1985

This project was to investigate the use of various new reagents in the derivatisation of bile alcohols for GC-MS analysis. This project was then continued at University of Glasgow, July 1983-June 1984

University of Glasgow & Western Infirmary Postdoctoral Research Fellow 1982-1983 Continued research on the steroidal boronic acids synthesis and studying the synthesis of some cholesterol analogues, useful as standards for sterols in blood analysis. This research was continued to separate and characterise the key intermediate epimeric compounds in our steroid side chain synthesis program.

**The Ph.D. Degree**

The work carried out for my Ph.D. Degree proved particularly rewarding since it allowed me to gain expertise in Organic Synthesis, under the supervision of internationally recognised steroid expert Professor C.J.W. Brooks. In addition, the work involved considerable use of spectroscopic and chromatographic methods (vide infra). Specifically, the research was aimed at developing the synthesis of steroidal boronic acids, some of which could possibly be applied in cancer therapy, by reason of the property of B10 whereby the nucleus has a high cross-section for neutron capture, leading to the liberation of 2.4 MeV of energy per nuclear reaction. This has future potential because analogous research could be developed with the other classes of biologically important compound. Also, another field of interest arising from my Ph.D. work is the analysis of some biologically important amines, catechol estrogens and diols in general, in biological fluids; this involves development of new derivatisation techniques together with the use of GLC, (including capillary GLC) and GC-MS.

**APPENDIX I I**

**Academic – Industrial Collaboration Projects:**

**Glaxo Group Research Ltd, Ware, England**

In this project 122 pages plus Appendix book has been written on investigation of the impurities of synthesis formed in the Glaxo commercial production of BeclomethasoneDipropionate. This book is classified by the Company as highly confidential. This research was conducted by me under a confidentiality agreement with Glaxo Group Research, during 3 years tenure of a post-doctoral fellowship and was supervised by Professor C.J.W. Brooks.The investigation was required in order to discharge an undertaking made by Glaxo Group Research to the Food and Drug Administration in the U.S.A. for provision of information as to the identities of potential impurities of synthesis of BDP. This research records the results of an investigation of the potential impurities associated with the Glaxo synthesis of the anti-inflammatory steroidal drug substances, (BDP), with particular emphasis on those occurring in the mother liquors from each of the recrystallisations routinely employed in commercial production, together with the results of some investigations as to the ease of chemical degradation of

BDP under various conditions. Within this work a total of 49 individual impurities of synthesis were isolated from the mother liquor from the first commercial recrystallisation of BDP, to varying degrees of purity. Of the 49 compounds isolated, 46 were steroids related in structure to BDP and its synthetic intermediates.

Evidence was also obtained that there are at least 22 further impurities to the mother liquor still to be isolated and characterised. All the IR, UV, H- and C-NMR, X-ray, MS, GC-MS, LC-MS, GC, HPLC and TLC data of the isolated components were investigated and tabulated.

**Perstorp Ferguson Co. Newton Aycliffe, England**

This project was on the development of certain phenolic resins in collaboration with the Ex-Chief Chemist of Perstorp Ferguson, Dr. Roger Taylor. This was from the 2 year postdoctoral research project and was conducted under a confidentiality agreement with this company and in collaboration with Professor C. J. W. Brooks at Glasgow University.

Summary: The alkaline-catalysed reaction of phenol with formaldehyde is concentration, time and temperature dependent. In order to isolate and identify some of the active components of the produced resins, chromatographic methods of TLC, dry column silica gel and HPLC were used, in the early stages of this project. Various HPLC systems were developed and a suitable new system was invented to handle the highly alkaline (pH 14) resins, without sample modification, and to obtain good separation for most of the components in the resin mixture qualitatively and quantitatively. TLC and dry column silica gel chromatographs showed limited separation. The HPLC of the resin showed 25 components and most were isolated and characterised by NMR, MS and GC-MS (after trimethylsilyationandacetylation). For comparative studies, reference phenolic methylols and resins were prepared.