



## Dr. Faiz Ali

Department of Chemistry, University of Malakand, Dir (L) KPK, Pakistan.

Phone Cell +923480961065 [faizy186@gmail.com](mailto:faizy186@gmail.com)

---

### Research Interest and Profile

Preparation of silica particles with improved chromatographic performance and their modification via surface chemistry modification protocols developed in our laboratory and organic synthesis resulting in various new materials. Working in analytical chemistry and chemical engineering (separation science), with more specific research area being the preparation of advanced HPLC (high performance liquid chromatography) and CEC (capillary electro chromatography) columns of very high separation efficiency and enhanced chromatographic performance based on inorganic (silica) and organic monolith materials.

Development of tailor made procedure for synthesis of new materials ranging between sub-1 $\mu$ m to sub-5 $\mu$ m porous silica particles with variable pore size distribution. Modification of those suitably tailor made silica particles to highly efficient various stationary phases with improved chromatographic performance. Development of columns for fast HPLC analysis, rocket disposable-micro columns.

Preparation of highly efficient CEC and long LC columns for carbohydrate, peptide and protein analysis. Coupling of our developed long LC and also the OT-CEC columns with mass spectrometry (LC/MS and CEC/MS) to give much better exploration of carbohydrates, peptides and proteins crucial for biomarker discovery like cancer etc. Grafting of acrylonitrile on cellulose obtained from various sources.

Open tubular (OT-CEC) columns, MIPs (molecularly imprinted polymers), organic synthesis, sample pretreatment, and method development are some of the striking researching areas.

### Current employment

- ✓ Assistant Professor, Department of Chemistry, University of Malakand, Chakdara, Dir lower, KPK, Pakistan

### Previous employment

- ✓ Head Department of Chemistry, Faculty of Basic and Applied Sciences, University of Poonch, Rawlakot, Azad Jammu and Kashmir, Pakistan.
- ✓ Research Scientist, INHA industry partnership institute.

### Post-doctorate

- ✓ 17 months post-doctoral experience from *Sep 1st 2014 to Jan 30, 2016*, at Institute for Basic Sciences (IBS), department of chemistry and chemical engineering, graduate school, Inha University South Korea

### Industrial Experience

Experience in quality control in a pharmaceutical company

### MSc thesis

- ✓ Grafting of Acrylonitrile on cellulose obtained from rice husk.

### PhD dissertation

- ✓ Advanced HPLC and CEC columns of very high separation efficiency based on inorganic and organic monolith materials

### **Students supervised**

- ✓ Four BS students, University of Malakand

### **Students under supervision**

- ✓ Three M-phil. Students in supervision, University of Poonch Rawlakot.
- ✓ Three M-phil. Students in co-supervision, University of Malakand Chakdara.

### **Memberships.**

#### **Editorial Board Member**

- UK Journal of Pharmaceutical and Biosciences (UKJPB) [http://www.ukjpb.com/editorial\\_board.html](http://www.ukjpb.com/editorial_board.html)
- Pakistan Chemical Society

#### **Organizing Committee Member in International conference**

- ✓ Scientific Member to the 5th International Conference on Nano Science and Nanotechnology 2018 at the International Institute of Knowledge Management.
- ✓ Organizing Committee member in Two-Day Workshop on Recent Advances in Hyphenated & Online Analytical Techniques, held on 05 to 06 June 2018, the University of Poonch Rawalakot, AJK, and Pakistan.
- ✓ International Conference and Expo on Separation Techniques San Francisco, USA August 10-12, 2015
- ✓ 27th National and 15th International Chemistry Conference (Chemcon2016), August 22-25, 2016 at the University of Malakand, Chakdara, Dir (Lower), Khyber Pakhtunkhwa, Pakistan.

### **Reviewing Activity**

Reviewing papers for the following Journals

**Journal of Analyst**

**Journal of Analytical methods**

**Royal Society of Chemistry**

**Journal of the Chemical Society of Ethiopia**

**UK Journal of Pharmaceutical and Biosciences (UKJPB)**

### **Projects**

- 1) Research project under Start Up Research Programme for fresh assistant professor by Higher Education Commission of Pakistan. 21-1031/SRGP/R&D/HEC/2016 dated August 15, 2016.
- 2) Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2012 R1A1A2006066).
- 3) Converging Research Center Program through the Ministry of Science, ICT & Future

Planning of Korea (2013K000446).

- 4) Brain Korea (BK-21) a Korean government project.
- 5) Preparation of ground silica monolith particles of improved chromatographic performance as chromatographic separation and support media.
- 6) Separation of protein and peptides and carbohydrates using open tubular CEC columns and long LC-columns and using those columns in combination with Mass spectrometry for the complete structural elaboration of peptides and proteins. Very recently we have got approval for a new project about the separation of peptides and protein by LC-MS. We had a collaboration with Zaid Al-Oathman (chairman of chemistry department) from King Saud University.

### Member of Various Committees as Assistant Professor

1. Convener of the Board of Studies, Department of Chemistry, University of Poonch, Rawlakot, AJK, Pakistan.
2. Graduate Committee, Faculty of Basic and Applied Sciences, UPR, AJK, Pakistan,
3. Registration Committee (member) for the 27th National and 15th International Chemistry Conference, University of Malakand.
4. Logistic Committee (member) for the 27th National and 15th International Chemistry Conference, University of Malakand.
5. Exhibit Committee (member) for the 27th National and 15th International Chemistry Conference, University of Malakand.
6. Admission Committee (member), Department of Chemistry, University of Malakand.
7. Purchase Committee (Convener), My Start up Research Project (HEC).
8. Thesis Evaluation Committee (member), Department of Chemistry, University of Malakand.

### Publications

1. Sedimentation assisted preparation of ground particles of silica monolith and their C18 modification resulting in a chromatographic phase of improved separation efficiency. *Ashraf Ali, Faiz Ali, Won Jo Cheong. J. Chromatogr. A 1525 (2017) 79-86.*
2. High Efficiency Robust Open Tubular Capillary Electrochromtography Column for the Separation of Peptides. *Faiz Ali, Won Jo Cheong. Bulletin of the Korean Chemical Society 37 (8), (2016), 1374-1377.*
3. Open Tubular Capillary Column for the Separation of Cytochrome C Tryptic Digest in Capillary Electrochromatography. *Faiz Ali, Won Jo Cheong. J. Sep. Sci. 2015, 38 (20), 3645–3654.*
4. Cheap C18 Modified Silica Monolith Particles as HPLC Stationary Phase of Good Separation Efficiency. *Ashraf Ali, Faiz Ali, Won Jo Cheong, Bull. Korean Chem. Soc. 2015, Vol. 36, 1733–1736.*
5. Open Tubular Capillary Electrochromatography with an *N*-Phenyl Acrylamide-Styrene Copolymer-based Stationary Phase for the Separation of Anomers of Glucose and Structural Isomers of Maltotriose. *Faiz Ali, Won Jo Cheong. F. Ali et al J. Sep. Sci. 2015, 38(10), 1763–1770.*

6. C<sub>18</sub>-bound Porous Silica Monolith Particles as a Low-Cost High Performance Liquid Chromatography Stationary Phase with an Excellent Chromatographic Performance. **Faiz Ali**, Won Jo Cheong. *F. Ali et al. J. Sep. Sci.* 2014, 37(23), 3426–3434.
7. Ground Organic Monolith Particles Having a Large Volume of Macropores as Chromatographic Separation Media. Jin Wook Lee, **Faiz Ali**, Yune Sung Kim, Won Jo Cheong. *Bull. Korean Chem. Soc.* 2014, 35(7) .2033.
8. Immobilization of Styrene-acryl Amide Co-polymer on Either Silica Particles or Inner Surface of Silica Capillary for the Separation of D-Glucose Anomers. **Faiz Ali**, Yune Sung Kim, Won Jo Cheong. **Faiz Ali et al** *Bull. Korean Chem. Soc.* 2014, Vol. 35(2), 539.
9. Catalyst Assisted Synthesis of Initiator Attached Silica Monolith Particles via Isocyanate-hydroxyl Reaction for Production of Polystyrene Bound Chromatographic Stationary Phase of Excellent Separation Efficiency. **Faiz Ali**, Yune Sung Kim, Jin Wook Lee, Won Jo Cheong. *F. Ali et al. J. Chromatogr. A* 1324 (2014) 115–120.
10. Polystyrene Bound Stationary Phase of Excellent Separation Efficiency Based on Partially Sub-2µm Silica Monolith Particles **Faiz Ali**, Won Jo Cheong, Zeid A. ALothman, Abdullah M. ALMajid. *F. Ali et al. / J. Chromatogr. A* 1303 (2013) 9–17. <http://dx.doi.org/10.1016/j.chroma.2013.06.016>
11. Comprehensive Overview of Recent Preparation and Application Trends of Various Open Tubular Capillary Columns in Separation Science (Review). Won Jo Cheong, **Faiz Ali**, Yune Sung Kim, Jin Wook Lee. *W.J. Cheong et al. / J. Chromatogr. A* 1308 (2013) 1–24. <http://dx.doi.org/10.1016/j.chroma.2013.07.107>
12. Recent Applications of Molecular Imprinted Polymers for Enantio-Selective Recognition. Won Jo Cheong, **Faiz Ali**, Ji Ho Choi, Jin OoKLee, Kim Yune Sung, *W.J. Cheong et al. / Talanta* 106 (2013) 45–59. <http://dx.doi.org/10.1016/j.talanta.2012.11.049>.
13. Molecular Imprinted Polymers for Separation Science: A Review of Reviews. Won Jo Cheong, SongHee Yang, **Faiz Ali**. *W. J. Cheong et al. J. Sep. Sci.* 2013, 36, 609–628. DOI 10.1002/jssc.201200784
14. Preparation of C<sub>18</sub>-Modified Silica Monolith Packed HPLC Column for Separation of Peptide and Proteins. **Faiz Ali**, Won Jo Cheong. Under review in Journal of Analytical methods.
15. Separation of Peptides and Proteins in Tryptic Digest of Cytochrome C by Step Elution Approach in Open Tubular Capillary Electrochromatography. **Faiz Ali**, Won Jo Cheong. Under review in Journal of Electrophoresis.

### Conference papers (Presentations)

- 1) **Faiz Ali**, Won Jo Cheong, “Demonstration of a Novel Step Elution Approach in Open Tubular Capillary Electrochromatography” 29<sup>th</sup> National and 17<sup>th</sup> International Chemistry Conference, Sep 06-08, 2018. University of Peshawar, Pakistan.
- 2) **Faiz Ali**, Won Jo Cheong, Behisht Ara Preparation of Partially Sub-1 µm Inorganic-Organic Hybrid Silica Monolith Materials as Highly Efficient Stationary Phases in Reverse Phase Liquid Chromatography. First International Conference on “Emerging Trends in Material Sciences” February

2018. Islamia College University Peshawar.

- 3) **Faiz Ali**<sup>1</sup>, Won Jo Cheong<sup>2</sup>, Behisht Ara<sup>1</sup> “Separation of Peptides and Proteins in Tryptic Digest of Cytochrome c by Novel Step Elution Approach in Open Tubular Capillary Electrochromatography”. 7<sup>th</sup> International Conference and Exhibition on Analytical & Bioanalytical Techniques. *J Anal Bioanal Tech*. DOI:10.4172/2155-9872.C1.024. September 28-30, 2016 Orlando, USA.  
<https://www.omicsonline.org/proceedings/separation-of-peptides-and-proteins-in-tryptic-digest-of-cytochrome-c-by-novel-step-elution-approach-in-open-tubular-cap-52835.html>
- 4) **Faiz Ali**, Won Jo Cheong, Robust Open Tubular Capillary Electrochromatography Column for the Separation of Peptides and Proteins in Tryptic Digest of Cytochrome.C” 27th National and 15th International Chemistry Conference (Chemcon 2016).
- 5) **Faiz Ali**, Won Jo Cheong, C18-bound partially sub-1µm porous silica monolith particles as low cost HPLC-stationary phase of excellent chromatographic performance and fast HPLC analysis. 6<sup>th</sup> International Conference and Exhibition on Analytical & Bio analytical Techniques. September 01-03, 2015 Valencia, Spain. *Faiz Ali et al., J Anal Bioanal Tech 2015, 6:4*<http://dx.doi.org/10.4172/2155-9872.S1.021>
- 6) **Faiz Ali**, Won Jo Cheong, Formation of a layer of N-phenyl acryl amide - styrene co-polymer on the inner surface of silica capillary for excellent separation of saccharide isomers by CEC. International conference and expo on separation techniques, August 10-12, 2015. San Francisco, USA. <http://separationtechniques.conferenceseries.com/2015/poster-presentation.php>
- 7) **Faiz Ali**, Yune Sung Kim, Ashraf Ali, Sin Young Park, Sung Hoon Hong, Won Jo Cheong, Robust Open Tubular Capillary Electrochromatography Column for the Separation of Oligosaccharide Structural Isomers. Global Conference on Engineering and Applied Science (GCEAS), July 06-08, 2015, Hong Kong.
- 8) **Faiz Ali**, Won Jo Cheong, Open Tubular Silica Capillary Columns immobilized with N-phenylacrylamide-Styrene Copolymer for Separation of Structural Isomers of Saccharides by CEC. Asian Conference on Engineering and Natural Sciences (ACENS-2015), Feb 03-05, 2015, Tokyo Japan.
- 9) **Faiz Ali**, Won Jo Cheong, N-phenyl acrylamide-Styrene Copolymer Immobilized Silica Capillary Columns for Saccharide Analysis (Maltotriose Isomers and D-glucose Anomers) by CEC. *Korean Chemical Society conference, Oct 15-17, 2014, Gwanju, South Korea*. [http://new.kcsnet.or.kr/?mid=pop\\_program\\_view&main\\_number=114&uid=28748](http://new.kcsnet.or.kr/?mid=pop_program_view&main_number=114&uid=28748)
- 10) **Faiz Ali**, Won Jo Cheong, Formation of a layer of N-phenyl acryl amide - styrene co-polymer on the inner surface of silica capillary for excellent separation of saccharide isomers by CEC. *Korean Chemical society conference, Oct 27, 2014. GIST, Gwanju, South Korea*. [https://kcsnet.or.kr/?mid=abstract\\_view&uid=28748&page=36&wordfield=partnum&main\\_number=114](https://kcsnet.or.kr/?mid=abstract_view&uid=28748&page=36&wordfield=partnum&main_number=114)
- 11) C<sub>18</sub> Modified Partially Sub-1µm Porous Silica Monolith Particles as HPLC Stationary Phase of Tremendously High Separation Efficiency. **Faiz Ali**, Yun Sung Kim, Won Jo Cheong. *Korean*

Chemical society conference, April 16-18, 2014 KINTEX, Goyang (Seoul) South

Korea. [http://test.kcsnet.or.kr/?mid=abstract\\_view&uid=27155&page=37&wordfield=partnum&main\\_number=113](http://test.kcsnet.or.kr/?mid=abstract_view&uid=27155&page=37&wordfield=partnum&main_number=113)

- 12) Catalytic Ligand Binding on Porous Partially Sub-2 $\mu$ m Silica Monolith Particles and Styrene Mediated RAFT Polymerization to Give Polystyrene Stationary Phase of Outstanding Separation Efficiency. **Faiz Ali**, and Won Jo Cheong. *40th International Symposium on high performance liquid phase separations and related techniques, 18th – 21st November 2013, The Hotel Grand Chancellor, Hobart, Tasmania, Australia.* <http://hplc-2013.m.asnevents.com.au/schedule/session/2132/abstract/8407>
- 13) Immobilization of Uniform Thin Polymer Film Upon Partially Sub-2 $\mu$ m Silica Monolith Particles via Catalyst Assisted Attachment of Initiator Moieties Resulting in a Stationary Phase of Outstanding Separation Efficiency. **Faiz Ali** and Won Jo Cheong. *2013 APCE, KSFEA & APIA 13th Asia pacific international symposium on Micro scale separation and Analysis. Bio analytical and Environmental applications. Nov 3-6, 2013/Lotte Hotel Jeju, Jeju Island. South Korea.*
- 14) Immobilization of Styrene-Acrylamide Co-Polymer on Partially Sub-2 $\mu$ m Silica Monolith Particles and Inner Surface of Fused Silica Capillary by RAFT Polymerization to Give Stationary Phases for the Separation of D-glucose Anomers. **Faiz Ali**, Jin OoK Lee, Kim Yune Sung, Won Jo Cheong. *Korean Chemical society conference, October 16-18, 2013 CECO Chagwon South Korea.* [https://new.kcsnet.or.kr/?mid=pop\\_program\\_view&main\\_number=112&uid=25614](https://new.kcsnet.or.kr/?mid=pop_program_view&main_number=112&uid=25614)
- 15) Polystyrene Coated Partially Sub-2 $\mu$ m Silica Particulate Stationary Phase of Exceptional High Separation Efficiency. **Faiz Ali** and W.J Cheong. *111th General Meeting of Korean Chemical Society April 17~19, 2013 KINTEX, Goyang*
- 16) Polystyrene Coated Silica Based HPLC Stationary Phase of High Separation Efficiency. **Faiz Ali**, Ji Ho Choi, Kim Yun Sung, Lee Jin Wook, W.J Cheong. *1st Annual International Conference on Chemistry, Chemical Engineering and Chemical Process (CCECP 2013) 25 – 26 February 2013, Singapore DOI: 10.5176/2301-3761\_CCECP.55* <http://dl4.globalstf.org/?wpsc-product=polystyrene-coated-silica-based-hplc-stationary-phase-of-high-separation-efficiency>
- 17) Silica Monolith Particles of Improved Separation Efficiency and Their Modification with Polystyrene by RAFT Polymerization. **Faiz Ali** and W.J Cheong. *2012 International Conference on Environment, Chemistry and Biology IPCBEE vol.49 (2012) © (2012) IACSIT Press, Singapore DOI: 10.7763/IPCBEE. 2012. V49. 7* <http://www.ipcbee.com/vol49/007-ICECB2012-E016.pdf>
- 18) Preparation of an Efficient Polystyrene Stationary Phase by the Modification of Silica Monolith Particles of Improved Characteristics via RAFT Polymerization. **Faiz Ali** and W.J Cheong. *Korean Chemical Society conference, October 17~19, 2012 BEXCO, Bussan South Korea.* [http://test.kcsnet.or.kr/?mid=abstract\\_view&uid=22447&page=1&qpage=&word=39&wordfield=partnum&main\\_number=110](http://test.kcsnet.or.kr/?mid=abstract_view&uid=22447&page=1&qpage=&word=39&wordfield=partnum&main_number=110)
- 19) Ground Silica Monolith Particles Prepared by a New Simplified and Cost-Effective Process. **Faiz Ali** and W.J Cheong. *Korean Chemical Society conference, April 25~27, 2012 KINTEX,*

Goyang (Seoul) South

Korea. [http://new.kcsnet.or.kr/?mid=pop\\_program\\_view&main\\_number=109&uid=21983](http://new.kcsnet.or.kr/?mid=pop_program_view&main_number=109&uid=21983)

## Awards, Distinctions and Achievements

1. Finalist, California science separation society (CASSS) grant for HPLC-conference in Hobart (18-21 Nov, 2013), Tasmania-Australia. Paper link:  
<http://hplc-2013.m.asnevents.com.au/schedule/session/2132/abstract/8407>  
<http://www.hplc2013-hobart.org/casss-student-travel-grants/>
2. Brain Korea 21 (BK 21), Korean government scholarship, Sep 2013 to June 2014.
3. Jungseok memorial fellowship, graduate school Inha University Sep 2010 – Aug 2013
4. Research assistant scholarship, graduate school Inha university Sep 2013-Aug 2014
5. Teaching assistantship, graduate school Inha University Mar 2012- July 2014.
6. Achievement award from Deudes company Germany on Oxylog 1000 (artificial ventilator) under government secretariat Peshawar.
7. Best performance award during workshop on ACLS (advanced cardiac life support) and BCLS (basic cardiac life support), department of cardiology LRH (lady reading hospital) Peshawar.
8. School topper award in secondary school certificate (SSC) /Matric, and among top ten students in the board of BISE swat in HSSC/FSc/Intermediate.

## Skills

### Technical skills

High Performance Liquid Chromatography, Capillary Electro Chromatography, Capillary Electrophoresis, Method development, Sample pretreatment and sample preparation, Derivatization techniques, Field Emission Scanning Electron Microscopy (FE-SEM), Field Emission Electron Microscopy (FE-TEM). Ultra violet detectors, IC, Classical techniques, interpretation of NMR, IR and spectroscopy etc.

### Computer skills

Ms Office, Excel, Power point, Chemoffice, Chemstation, Chemdraw, Origin Pro-8, Image partner, Multicrow etc.

## Education

### PhD *Analytical chemistry (advanced separation science)*

Sep 2010- Aug 2014 (CGPA = 4.46 out of 4.5) with 99.5% marks

Department of chemistry and chemical engineering (Nanofine center, high energy material Science), graduate school, Inha University South Korea.

### Masters *Organic chemistry*

Sep 2006 – Oct 2008 (First class, IsDiv)

Department of Chemistry, University of Malakand, Chakdara, Dir Lower, KPK, Pakistan

### BSc / Undergraduate (chemistry)

Aug 2006 ((First class, IsDiv)

University of Malakand, KPK, Pakistan, KPK, Pakistan

### Intermediate HSSC/FSc (Pre-medical)

2001 grade. A (76%)

Government Post-Graduate JehanZeb college BISE Saidu Sharif Swat, KPK Pakistan

## **Matric/ SSC.**

1998, grade. A (76%)

Government higher secondary school Charbagh, BISE Saidu Sharif Swat, KPK, Pakistan

## **Research Experience/ Research Areas.**

- Expertise in HPLC, capillary electro chromatography, surface chemistry, liquid chromatography, LC/MS etc.
- Stationary phases being synthesized in the form of bulk ground monolith particles and thin layer on the inner surface of capillary column used either as packed HPLC columns OR in the form of open tubular capillary column.
- Preparation of packed HPLC and open tubular CEC columns of enhanced chromatographic performance.
- Synthesis of ground silica monolith particles in sub-1 $\mu$ m to sub-5 $\mu$ m scale with narrow particle size distribution and their modification to polystyrene bound silica monolith, C18 bound silica monolith, acryl amide bound silica monolith, N-phenyl acryl amide bound silica monolith particles as chromatographic stationary phases etc.
- Immobilization of silica monolith layer on the inner surface of capillary column followed by the chemical anchoring of various moieties/reagents in the polystyrene bound phase by RAFT-polymerization resulting in various stationary phases of better chromatographic performance.
- Development of advanced chromatographic CEC and long LC columns for carbohydrate, peptides and proteins analysis. Long LC-columns will be coupled to mass spectrometry for the complete structural elucidation of glycan to know much about the glycan pool of saccharides useful for biomarker discovery of various disease like cancer etc.
- Sample pretreatment such as amination and reductive amination of saccharides and new method development for sample preparation.
- Reversible addition fragmentation chain transfer (RAFT) polymerization and atom transfer radical (ATRP) polymerization for synthesis of polystyrene bound silica monolith particles as chromatographic stationary phases.
- Synthesis of mono-dispersed non-porous silica beads followed by immobilization of porous shell upon them to form core-shell type particles as chromatographic separation media for fast and high throughput analysis at lower column back pressure with high separation efficiency.
- Preparation of cellulose 4-methylbenzoate from microcrystalline cellulose
- Grafting of acrylonitrile on cellulose obtained from agricultural wastes such as rice husk, banana peel etc. for the preparation of low cost adsorbate. (Masters research project)

## **Professional Experience**

- 1) Post-doctoral researcher at Institute for Basic Sciences (IBS), graduate school, Inha University, South Korea.
- 2) Lab assistant from March 2013 to June 2014, graduate school INHA University South Korea.
- 3) Teaching assistant from March 2012 to Dec 2013, graduate school Inha University South Korea.
- 4) Lecturer in chemistry, Excelsior college Swat, KPK, Pakistan March 2009- June 2010
- 5) Part time job (March 2009 to March 2010) in quality control in Swat pharmaceutical company KPK, Pakistan.
- 6) Volunteer job in a medical camp for the flood affecties in Swat in 2010.



## Objectives

- To develop my career in creative and innovative society in the field of my major of interest. Working in a team based-projects to improve my skills both in academic and R & D sectors with special focus on advance separation techniques for the separation of analytes of commercial interest applicable in areas, like pharmaceuticals, therapeutics, clinical diagnosis, biomarker discovery, genetics, biochemistry and sensors etc.
- To attend various field relevant activities like conferences, seminars, consortiums, workshops, symposia, and exhibitions etc.
- Seeking a mid-career job in any well reputed company/academia, working in the field of analytical Chemistry particularly in separations (PHLC, UHPLC, CE, and CEC. LC/MS, GC etc).

## References

### **Won Jo Cheong**

Designation: Professor

Department: Department of chemistry and chemical engineering, graduate school, Inha University South Korea

Research areas: Separation sciences, HPLC, CEC, LC/Ms, etc.

Email: wjcheong@inha.ac.kr

### **Sang Eon Park**

Designation: Professor

Department: Department of chemistry and chemical engineering, graduate School, Inha University South Korea.

Research Areas: Catalysis, green chemistry.

Email: separk@inha.ac.kr

### **Fazal Mabood Associate Professor**

Designation: Assistant professor (analytical chemistry)

Department: Department of biological sciences and chemistry, University of Nizwa

Email: mehboob@unizwa.edu.om

Cell Phone: 0096895971085

Homepage: URL: www.unizwa.edu.om

### **Ponnaboina Thirupathi**

Designation: Assistant professor

Department: Department of chemistry and chemical engineering, graduate school, Inha University, South Korea.

Email: pthiruchem2@inha.ac.kr

Cell phone: 0082-10-4966-1690

## Affiliations

Department of Chemistry, University of Malakand, Chakdara, Dir Lower, Khyber Pukhtunkhwa, Pakistan.

Email: faizy186@gmail.com