

## Brief Bio-data

1. **Name:** Dr Firoj Ali

2. **Date of Birth:** 22<sup>nd</sup> December 1986

3. **Current Position and Address (Include Email ID and Contact Number):**

Scientist;

Rock Excavation Engineering Research Group, CSIR-Central institute of Mining and Fuel Research, Dhanbad. Email.id. [firojali@cimfr.nic.in](mailto:firojali@cimfr.nic.in)/[firojchem86@gmail.com](mailto:firojchem86@gmail.com)

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1. **Educational qualifications: (Graduation and above)**

Sl. No.	Degree	Year of Passing	University/Institute	Subject
1.	BSc	2009	University of Burdwan, West bengal	Chemistry (HONS)
2.	MSc	2012	Bengal Engineering and Science University, Shibpur, Howrah, West Bengal	Applied Chemistry
2.	PhD	2017	AcSIR, CSIR-National Chemical Laboratory, Pune	Chemical Science

5. **Work experience:**

Designation	Institute/company	From	To	Nature of Work
Post Doc Research Associate	University of Birmingham, United kingdom.	04.12.2017	01.12.2018	Development of Hydrogel based optical sensors for the biomolecules. Synthesis of sensor molecules, preparation of hydrogels & its characterizations, etc.
Scientist	CSIR-CIMFR, Dhanbad	13.12.2018	Till now	Development of new cost effective explosives for mining application, Control blasting operation, development of new techniques for the eco-friendly mining operation, etc.

6. **Work Area(s)/ Specialization:**

- Development of new cost effective explosives for mining application.
- Development of new chemical compositions for Dust control during blasting operation.
- Quality monitoring of Explosives & blasting accessories at laboratory and mining site.

7. **Major contributions: (Max. 100 words):**

We have developed a chemical composition to suppress the dust emission to control dust generation during blasting operations. With this product mining industry will be highly benefitted and this technology will provide a step ahead towards green mining methods.

Further we have developed cost effective explosive compositions by using environmental hazardous waste lubricant oil. With this research work a toxic material will be recycled into a useful product along with a reduced cost.

## 8. No. of Research Publications: 19

- **Papers in Journals: 17**
- **In conference proceedings: 01**
- **Invited lectures delivered: 01**
- **List of best 05 publications:**

- (i) **F. Ali**, Anila H. A., N. Taye, R. G. Gonnade, S. Chattopadhyay, A. Das. A fluorescent probe for specific detection of cysteine in the lipid dense region of cells, *Chem. Commun.*, 2015, **51**, 16932-16935. (RSC Publication) (I.F: 6.222).
- (ii) **F. Ali**, S. Sreedharan, A. H. Ashoka, H. K. Saeed, C. G. W. Smythe, J. A. Thomas, A. Das. A super-resolution probe to monitor HNO levels in the endoplasmic reticulum of cells, *Analytical Chemistry*, 2017, **89**, 12087-12093. (ACS Publication) (I.F: 6.986).
- (iii) **F. Ali**, S. Aute, S. Sreedharan, H. A. Anila, H. K. Saeed, C. G. Smythe, J. A. Thomas, A. Das. Tracking HOCl concentrations across cellular organelles in real time using a super resolution microscopy probe, *Chem. Commun.*, 2018, **54**, 1849-1852. (RSC Publication) (I.F: 6.222).
- (iv) **Ali F.**, Pingua B. M. P., Dey A., Roy M. P., Singh P. K. Surface functionalized ammonium nitrate prills with enhanced water resistance property: characterizations and its application as commercial explosives. *Propellants Explosives, Pyrotechnics*, 2021, **46**, 78-83. (Wiley-VCH). (I.F: 1.887).
- (v) **Ali F.**, Roy M. P., Pingua B. M. P., Mukherjee R., Agarwal L., Singh P. K. Utilization of waste lubricant oil in fuel phase of ANFO explosives: its field applications and environmental impact. *Propellants Explosives, Pyrotechnics*, 2021, DOI: 10.1002/prop.202100011. (Wiley-VCH) (I.F: 1.887).

- **Books/Chapters authored/edited: 01**

Comprehensive Supramolecular Chemistry II: Chapter: 12617; 2017, Elsevier Inc.; vol. 8, pp. 319–349. Oxford: Elsevier. ISBN: 9780128031988, Title: Specific Receptors and Imaging Reagents for Certain Heavy Metal Toxins, Anila HA, **Firoj Ali** and Amitava Das.

## 9. List of 5 Major Contract R&D Projects:

- (i) Use of Fuel oil in Mining Explosives and Safety Characteristics (**MLP-78/2019-20**, Ongoing project, Role: **Project Leader**).
- (ii) Advice and assessment on explosive quality, its accessories and safety suggestions for SME at OMQ, Tata steel (**SSP/402/2019-20**, Completed project, Role: **Project Leader**).
- (iii) Study on the effect of shock wave on ammonium nitrate prills (Optimex), (**TSP/60/2020-2021**, Ongoing project, Role: **Project Leader**).
- (iv) Consultancy services on evaluation of explosive and blasting accessories to improve its quality and suggestions at Jhamarkotra Mines, RSMML. (**CNP/4773/2018-19**; Ongoing project, Role: **Project Leader**).
- (v) Study and advice for optimisation of blast design parameters for flattening of southern portion of Ulwe Hill and as a part of the land development works for construction of Navi Mumbai International Airport (NMIA) (SSP/481/20-21, Ongoing project, Role: **Team member**).

**10. (a) Name of Patents/Copyrights applied /granted/commercialized:**

- (i) Ligand for detection of chromium (iii) and a process for the preparation thereof, **United States Patent, US 9, 823, 232 B2.**
- (ii) Compound for selected termination of free cysteine and a process for the preparation thereof; **United States Patent, US 10,730,891 B2.**
- (iii) Coumarin derivative for detection of cysteine and process for the synthesis thereof, **United States Patent, US 10, 030,002 B2.**
- (iv) A compound for the detection of hno in biological systems, **European Patent, EP 3 551 637 B1.**
- (v) A probe for selective detection of hypochlorous acid (HOCl) under physiological Condition, **United States Patent, US 2020/0102330 A1.**
- (vi) Molecular probes for selective determination of hydrazine, patent No. **2332/DEL/2015** Dt. 03.02.2017.
- (vii) A composition and method for preparation thereof for suppression of dust generated in blasting operations, Patent application No. **202011000277** Dt. 03.01.2020.
- (viii) A process for preparation of ammonium nitrate fuel oil explosives composition by recycling waste lubricant oil, Patent application No. **202111014942** Dt. 31.03.2021.

**(b) Technologies/Products /knowhow/Services developed:**

- (i) Dust suppressent technology for dust control during blasting operation.
- (ii) Cost effective recycled oil based ANFO explosives.

**11. Honors/Awards/Recognitions/Fellowships/Scholarships/Professional Memberships received:**

CSIR-Juniour research fellowship (JRF)–2012, All india rank 43 (CSIR NET exam).  
CSIR-Seniour research fellowship (SRF)–2014

**12. Societal Contributions:**

- I. My research work is mostly focused to resolve the blasting related issues and developed new mining explosive compositions for sustainable mining operations. I have developed a chemical composition to suppress the dust emission control during blasting operations. One trial experiment was conducted a Joda east iron ore Mines, Tata Steel Limited.
- II. Further, we have developed cost effective explosive compositions by using environmental hazardous waste lubricant oil. With this research work, a toxic material will be recycled into a useful product along with a reduced cost.
- III. Further, I am actively involved in numerous blasting related works at various mines for conducting control blasting for land development such as Navi Mumbai international Airport, Mumbai. This particular work done by our research group has received significant attention throughout the nation.