भारत सरकार, रक्षा मंत्रालय
रक्षा अनुसंधान तथा विकास संगठन
रक्षा अनुसंधान तथा विकास स्थापना
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Govt. of India, Ministry of Defence
Defence R & D Organisation
Defence R & D Establishment
Jhansi Road, Gwalior-474002
Telephone :0751-2390167
Fax No. : 0751-2341148

Date: 31/07/2024

Experience Certificate

1. This is to certify that **Ms Himanshi Dhyani** D/o **Shri Ganga Dutt Dhyani** is working as "Senior Research Fellow (SRF)" in this Organization and duties performed by her during the period(s) are as under :

Name of post held	From dd/mm/yy	To dd/mm/yy	Total period dd/mm/yy	Nature of Appointment Permanent, Regular, Temporary, Part-time, Contract, Guest, Honorary etc.	Department/Specially/Field of experience
(1)	(2)	(3)	(4)	(5)	(6)
Junior Research Fellow (JRF)	15/06/2020	14/06/2022	04 Years, 01 Months, and 09 Days	Temporary	**Defence R&D Establishment, (DRDO), Gwalior, India:** a) **Product Development:** Chem-Bio Protective Clothing, Chem Bio Protective Facemask and Antiviral & Antibacterial Fabric. b) **Testing & Evaluation of** Chem-Bio Protective Clothing and Chem Bio Protective Facemask against various toxicants. c) **Handling to various analytical instruments like** GC-MS, FTIR, Surface Area Analyzer, Tensile Strength Tester, Tear Strength Tester, Air permeability, Martindale Abrasion Tester, Spray Rating Tester and TGA.
Senior Research Fellow (SRF)	15/06/2022	Till date			

Monthly remuneration (total)	Duties performed/experience gained in brief in each post (please give details, if need be, in attached sheet) (in case of Medical posts, please mention field of specialization)	Place of posting	Nature of work: a) Managerial (Lower/Middle/Senior*) b) Supervisory c) Operative d) if none of the above, please indicate nature of work (*Strike off whichever is not applicable)
(7)	(8)	(9)	(10)
42000/- in SRF Period	1. Test and Evaluation of facemask (Splash Resistance Test) as per ASTM F1862. 2. Development of Antiviral and Antibacterial Fabric. 3. Development of Activated Carbon Fabric (ACF) based Chem-Bio Face Mask. i. Optimization of textile layers required. ii. Functionalization of ACF with different metal and metal oxides for protection against toxic industrial gases (TIC) and CWAs. iii. Testing and evaluation of different configurations of prototypes. 4. Comparative analysis of Physio-chemical properties of Activated Carbon Fabrics (ACFs) as adsorbents for Chemical Protective Clothing. 5. Determination of Tensile strength of protective textiles using standard ASTM D5035-11(2019). 6. Determination of Tear strength of protective textiles using standard ASTM D1424-21. 7. Determination of Air-permeability of protective textiles using standard ASTM D737-18(2023). 8. Determination of BET Surface area of materials using ASAP 2020 system, Micromeritics, Norcross, USA.	Defence R&D Establishment, (DRDO), Ministry of Defence, Jhansi Road, Gwalior (M.P.)-474002.	Supervisory/Operative in Research & Development of Textile Materials for the protection against Toxic Chemicals.

	9. Development of new apparatus and method for permeation evaluation of Activated carbon based systems used for the protection against Toxic Chemicals. i. Determination of extraction efficiency of sorbent disc against HD, GB & VX. ii. Validation of result for the permeation evaluation of activated carbon based system. 10. A Review paper published in Defence Life Science Journal entitled "Technology Trends and Future Opportunities in Development of NBC Protective Clothing." Vol. 7, No. 2, April 2022, pp. 118-130. DOI: 10.14429/dlsj.7.17199 11. Testing and evaluation of protective material for the protection against Toxicants by using i. Nerve agent penetration test facility ii. Sulfur Mustard (HD) Breakthrough test facility (Qualitative) iii. HD Liquid challenge test facility (Quantitative) 12. Development of cupric-oxide doped activated carbon fabric CuO@ACF for Advanced Self Decontaminating Chemical Protective Ensembles. 13. Paper presented entitled- "CuO Functionalized Activated Carbon Fabric (CuO@ACF) for Advanced Self Decontaminating Chem-Bio Protective Ensembles" in international conference Advanced Functional Materials: Future Perspectives AFMFP-2022 on 6-8th August, 2022 organized by NIT Jalandhar. 14. Development of polymer coated ACF to realize as a strong adsorbent material for chemical protective clothing.		

	15. Paper presented entitled- "Advanced activated carbon adsorbent filter material for the chemical protective clothing" in international conference Functional Textile and Clothing (FTC-2023) on 10-12th Feb, 2023 organized by IIT Delhi and published as a book chapter in Springer Proceedings in Materials, vol 42. Springer, Singapore. https://doi.org/10.1007/978-981-99-9983-5_3 16. Paper presented entitled- "Synthesis of cupric oxide on activated carbon fabric surface mediated by poly (diallyldimethylammonium chloride) for in-situ detoxification of Sarin: a chemical warfare agent" in state conference - 38th M.P. Young Scientist Congress organized by SATI, Vidisha during 17th to 19th March 2023. 17. Synthesis of UiO66 MOF over Activated Carbon Fabric surface for detoxification of Chemical Warfare Agent. 18. Paper presented entitled- "Degradation of scheduled chemicals over activated carbon fabric functionalized with UiO-66 (Zr-MOF)" in state conference - 39th M.P. Young Scientist Congress organized at MITS, Gwalior during 21th to 23th February 2024. 19. Patent filed on "Apparatus and method for generating chemical vapor standards". Patent Application No. 202311031984. 20. Patent filed on "Apparatus and method for measuring permeation of contaminants through a protective material". Patent Application No. 202311035684. 21. Patent filed on "Chem-bio face mask for the filtration of toxic gases, bacteria and viruses from air". Patent Application No. 202311084047.		

	22. A Research paper published in Composite Interfaces, Taylor and Francis Journal entitled "Detoxification of Toxic Nerve Agent Sarin Utilizing Cupric Oxide Functionalized Activated Carbon Fabric Composite for Advanced NBC Protective Clothing." April 2024, pp. 1-22. DOI: 10.1080/09276440.2024.2342087 23. A Research paper communicated in Journal of Textile Institute entitled "Comparative Analysis of Physico-chemical Properties of Activated Carbon Fabrics as Adsorbents Layer for Chemical Protective Clothing" on 31th July 2024.		

2. It is certified that above facts and figures are true and based on service records available in our organization/Department/Ministry.

Prabhat Garg
Scientist
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(Dr. Prabhat Garg)
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