

Office of the Chief Public Relations Officer
Jamia Millia Islamia

Press Release

JMI Researchers Granted Patent for Breakthrough in Green Chemistry; Aligns with global efforts to promote sustainable chemical manufacturing

New Delhi, November 19, 2025

Prof. Tokeer Ahmad and Dr. Farha Naaz from the Department of Chemistry, Jamia Millia Islamia, have been granted a patent marking a major breakthrough in nanocatalytic green chemistry. The patented innovation introduces a novel Ceria nanocatalyst-based method for synthesizing p-nitrobenzoic acid, a valuable fine chemical extensively used in pharmaceutical and chemical industries. This is the first time Ceria nanocatalysts have been successfully employed for this transformation. The newly developed catalytic process demonstrates 100% conversion and 99.29% selectivity, significantly surpassing existing traditional oxidation techniques. The method is cost-effective, scalable, and environmentally benign, aligning with global efforts to promote sustainable chemical manufacturing. p-Nitrobenzoic acid produced through this process serves as a key precursor for Phenacetin, an important pain-relief compound; Aminobenzoic acid and aminosalicyclic acid, used in pharmaceuticals; Folic acid intermediates, essential for various therapeutic formulations; Dyes, pigments, and other value-added industrial chemicals. This patented technology represents a significant advancement at the intersection of nanotechnology, catalysis, and green industrial chemistry, offering cleaner, safer, and more sustainable production routes for high-value chemicals. The innovation underscores Jamia Millia Islamia's growing leadership in advanced materials and green synthesis research.

Prof. Tokeer Ahmad is a world renowned researcher has expertise on designing of functional heterostructures for green hydrogen energy, CO₂ reduction and Nitrogen fixation in climatic and sustainable energy applications. Prof. Ahmad has supervised 16 PhD's, 10 projects, delivered 234 talks, 1 patent, 236 articles and 3 books with research citation of ~10,850, h-index of 61 and i10-index of 199. Prof. Ahmad is also the recipient of many medals and awards including CRSI/MRSI/SMC/ISCAS Medals, Inspired Teacher's President of India Award, DST-DFG award, Distinguished Scientist Award, Dr. S. S. Deshpande National Award, Maulana Abul Kalam Azad Excellence Award of Education, etc., elected member of National Academy of Sciences India and a Fellow of Royal Society of Chemistry.

Prof. Ahmad thanked Dr. Farha Naaz the other inventor of this patent, collaborators, and research funding agencies (ANRF, CSIR) for this innovative work.

Prof Tokeer expressed his deep gratitude to the Hon'ble Vice Chancellor, JMI, Prof Mazhar Asif and Registrar, JMI, Prof Md. Mahtab Alam Rizvi for their unwavering support, excellent infrastructural facilities and research environment, throughout his journey to develop this new technology, which made the patent a reality.

Prof. Saima Saeed
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