# Metal-Organic-Framework coated on Cellulosic fabric used for Dye Degradation by photocatalysis

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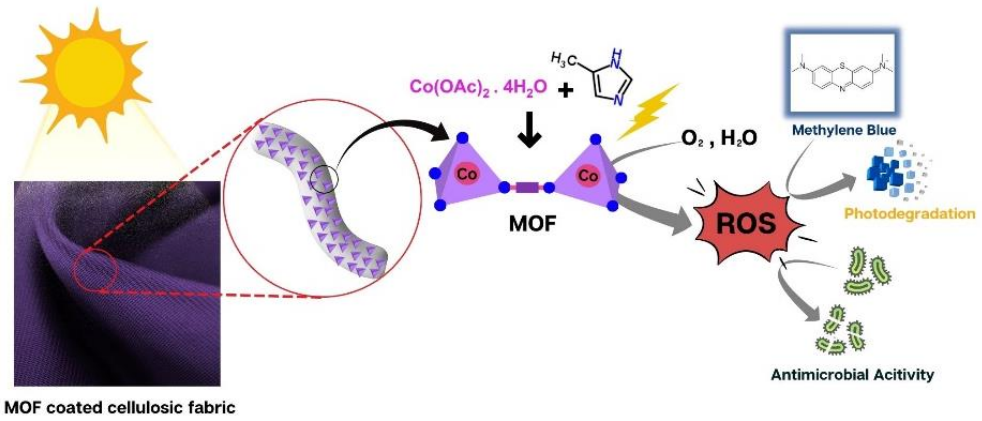
## Abstract:

Interest is growing in metal organic frameworks (MOFs) and their composites as effective photocatalysts for the degradation of dyes from wastewater.[1] A Cobalt-based MOFs of the Zeolitic Imidazole Framework (ZIF), typically comprised of isolated Co(II) ions bridged by imidazole linkers to form a M(II)–Im–M(II) bond angle of 145°, analogous to zeolites, are of research interest for their promising heterogeneous photocatalytic properties.[2] Co-MOF was grown in situ on viscose and cotton fabrics by reacting 2-methylimidazole (Im) and $Co(OAc)_2 \bullet 4H_2O$. FT-IR spectroscopy confirms the presence of Co-imidazole complexes on the fabric. SEM analysis revealed polyhedron type nanocrystals intimately adheres to the surface of the cellulose fiber. No obvious difference in fiber structure after coating was observed under LASER microscopy. A similar is confirmed by the Thermogravimetric analysis showing degradation of both coated and pristine fabric at identical temperatures (300 °C). The methylene blue dye stain disappeared from Co-MOF coated fabric within 5 min of light irradiation indicating excellent photocatalytic activity. Moreover, a reduction of >99% growth of both, gram+ve and gram-ve bacteria from Co-MOF coated fabric surfaces proves a high antibacterial property. Thus, a success story of Co-MOF coated fabric for dye photodegradation and anti-bacterial applications will be discussed in the poster presentation.




## References:

1. Maponya, T. C., Hato, M. J., Makhado, E., Makgopa, K., Khanuja, M., & Modibane, K. D. (2021). Photocatalytic Degradation of Dyes in Wastewater Using Metal Organic Frameworks. *Metal, Metal-Oxides and Metal-Organic Frameworks for Environmental Remediation*, 261–285
2. Qian, J., Sun, F., & Qin, L. (2012). Hydrothermal synthesis of zeolitic imidazolate framework-67 (ZIF-67) nanocrystals. *Materials Letters*, *82*, 220–223.