

## Scientists develop self-disinfecting anti-viral face masks

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**The copper-based nanoparticle-coated antiviral face masks are efficient against COVID-19 infection**



Scientists at International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), an autonomous R&D Centre of Department of Science and Technology (DST), Government of India, in collaboration with the Centre for Cellular & Molecular Biology (CSIR-CCMB) and Resil Chemicals, a Bengaluru-based company have developed the self-disinfecting copper-based nanoparticle-coated antiviral face masks under the DST sponsored Nano-Mission project, to fight against the COVID-19 pandemic.

ARCI developed copper-based nanoparticles of around 20 nanometres by a Flame Spray Pyrolysis (FSP) processing facility. FSP process involves the conversion of solution precursors into nanopowders by high-temperature pyrolytic decomposition. Stable nanoparticle suspension was obtained by optimising the solid loading and pH. A uniform layer of this nano-coating on the cotton fabric with good adhesion was achieved using a suitable binder.

The coated fabric exhibited an efficacy of more than 99.9 per cent against bacteria. CSIR-CCMB tested the efficacy of this fabric against SARS-CoV-2 for their disinfection properties and reported 99.9 per cent disinfection, as evident from the standard results. Prototype masks having different designs such as single layer and triple layers with nanoparticle coated fabric as outer layer have been demonstrated. A single layer mask is especially useful as a protective antiviral outer mask over a regular mask.