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D-orbital nano oxide catalysts for indoor air purification

ABSTRACT. Indoor air quality is crucial for health and safety, especially during this pandemic time, in which new airborne viruses pose a big threat to society. Currently available technologies for indoor air disinfection include ultraviolet light, bleach spray, ozone and hydrogen peroxide spray, all of which however result in the release of secondary pollutants and hence harm people in the room. We have developed a novel catalyst system, which can be incorporated in an air conditioner's filter or an air purifier's filter layer, allowing organic pollutants and biopollutants such as viruses and bacteria to be deactivated by photocatalytically generated active oxygen species without any secondary pollutants being generated. The concentrations of volatile organic compounds (VOCs, e.g. toluene and formaldehyde), noxious gases, odoriferous species, bacteria and viruses (e.g. H1N1, a subtype of influenza A) can be diminished, typically by more than 99.9%. The catalyst filter can typically last up to one year depending on the deposition rate of dust (mostly inorganic ash) that cannot be oxidized by air over the catalyst bed.

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