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(54) Title: A PHOTOCATALYST THAT REACTS WITH EM WAVES FOR ENHANCED EFFICIENCY

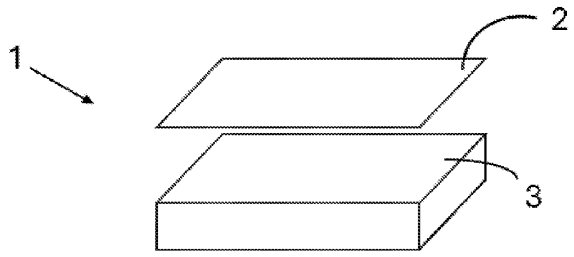

FIG. 1

(57) Abstract: The present invention discloses an apparatus for accelerating organic compound decomposition, based on photocatalyst comprising titanium dioxide (TiO_2) doped with copper (II) nitrate and/or zinc nitrate and/or aluminium nitrate. The disclosed Cu (II) -, Al (III) -and Zn (II) -doped TiO_2 materials exhibit enhanced visible-light absorption, improved charge separation, and stable reactive oxygen species (ROS) generation under neutral and broad pH environments. The Cu(II), Zn(II), and Al(III) dopants can promote efficient ROS formation for organic compound decomposition, without the severe electron-proton recombination caused by conventional iron (III) dopants. An installation application for air purification and ventilation is also provided, highlighting the Cu (II) -, Al (III) - and Zn (II) -doped TiO_2 photocatalysts in in a wide range of applications including but not limited to the mitigation of grease trap, sewage, toilet and garbage room odor.

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