Thin g-C_3N_4 Shell wall Grafted Monodispersed CuS Nanograin loaded free-standing Electrospun Carbon Nanofibers as Self-supported Visible Photocatalystic Web

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Hierarchical 1D platform of g-C_3N_4 loaded free standing CuS-Carbon nanofibers (NFs) with high visible photocatalytic activity has been successfully synthesized by combining the electrospinning process followed by the thermal influences with controlled chemical vaporization. To induce the monodispersity of the Cu grains with high conductivity of carbon fibers, GO has induced with the spinning precursor leads to avoid the aggregation of Cu ions in high-temperature carbothermal process. Further annealed CuO nanograins were modified into CuS nanograins through the controlled sulfidation in the hydrothermal conditions using thioacetamide as a sulfur source. In vapor phase condition thin layer of g-C_3N_4 were decorated as a shell finish over the free-standing CuS-Carbon fibers and leads the construction of ternary phase heterostructure in a free-standing web form. Catalytic results indicated that the efficiency of the ternary NF system (Carbon/CuS/g-C_3N_4) was effectively improved after g-C_3N_4 loading which is nearly 2.1 times faster than the pristine Carbon-CuS NFs over the pharmaceutical pollutant (tetracycline) under visible irradiation.