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Photocatalytic degradation of Methylene Blue by Nitrogen doped MoS2 under visible light irradiation

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Due to the development of industrialization, water pollution has become a global concern. The pollution of water resources by dyes from textile has become a serious environmental problem. Therefore it is very essential to remove the dyes from an aqueous environment. Herein, the removal of a cationic dye with N-doped MoS2 is investigated. Nitrogen doped MoS2 was successfully synthesized using sol gel method. It's crystal structure was measured by X-Ray Diffractometry (XRD). A Scanning Electron Microscope (SEM) and high resolution transmission electron microscope were used to observe the morphology and structure of the sample. Photocatalytic performance was evaluated by discoloring of Methylene Blue under visible light irradiation. N-doped MoS2 showed excellent photocatalytc activities and durability on the elimination of organic pollutants under visible light irradiation. It has larger BET areas. Due to this fact the surface adsorption capacity of the reactants is improved. Also more active sites are exposed, guaranteeing higher activity in degrading the dye. This work provides potential applications in water pollution treatment, as well as other related fields.

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Tissue analysis using hodge decomposition

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It has been seen that a vector field decomposition method called the Helmholtz Hodge Decomposition (HHD) can analyze scalar fields present universally in nature. It aids to reveal the complex internal energy flows in interference and diffraction fields. A gradient field defined in a region R, can be separated into solenoidal and irrotational components. HHD applied onto Magnetic Resonance Elasticity data can also aid to retain the curl field, while revealing the tissue elasticity in such medical measurements. The segmented shear waves in affected brain tissues were explicitly segmented and studied using our least square method of Hodge decomposition. HHD can also reveal the condition of tissues after they have been targeted with nanomedicines.

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