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Patent Search

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Abstract:

Predicting the Removal of Malachite Green by Bismuth Ferrite-based Photocatalysts using Deep Learning methods is the proposed invention. The proposed inventor studying the functions of Bismuth Ferrite-based Photocatalysts. The invention focuses on analyzing the parameters of removal of malachite green using algorithms of Learning.

Complete Specification

Description:[0001] Background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[0002] Deep learning is a method in artificial intelligence (AI) that teaches computers to process data in a way that is inspired by the human brain. Deep learning can recognize complex patterns in pictures, text, sounds, and other data to produce accurate insights and predictions. Deep learning models can recognize patterns such as: Pictures, Text, Sounds, Pixel data.

[0003] A number of different types of malachite green removal systems that are known in the prior art. For example, the following patents are provided for their supportive teachings and are all incorporated by reference.

[0004] Machine learning approaches to predict the photocatalytic performance of bismuth ferrite-based materials in the removal of malachite green:- This study focuses on the potential capability of numerous machine learning models, namely Gradient Boosting, Hist Gradient Boosting, Extra Trees, XG Boost, Decision Tree, Bagging, gradient boosting machine (LGBM), Gaussian Process, artificial neural network (ANN), and light long short-term memory (Light LSTM). These models were investigated to predict the photocatalytic degradation of malachite green from wastewater using various NM-BiFeO₃ composites. A comprehensive databank of 1200 data points was generated under various experimental conditions. The ten input variables selected were the catalyst type, reaction time, light intensity, initial concentration, catalyst solution pH, humid acid concentration, anions, surface area, and pore volume of various photocatalysts. The MG dye degradation efficiency was selected as the output variable. An evaluation of the performance metrics suggested that the CatBoost model, with the highest test coefficient of determination (0.99) and lowest mean absolute error (0.64) and root-mean-square error (1.34), outperformed all other models. The CatBoost model showed that the photocatalytic reaction conditions were more

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