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### Patent Search

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**Abstract:**

Electrical conduction and energy gap of bismuth ferrite (BiFeO<sub>3</sub>) nanoscale particles for solar energy conversion is the proposed invention. The proposed invention focuses on studying the Energy Gap of Bismuth Ferrite (BiFeO<sub>3</sub>) Nanoscale Particles. The invention focuses on analyzing the parameters of Electrical Conduction of Bismuth Ferrite Nanoscale Particles for Solar Energy Conversion using algorithms of Machine 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] Solar energy is radiant light and heat from the Sun that is harnessed using a range of technologies such as solar power to generate electricity, solar thermal and solar architecture. Solar energy is a renewable, inexhaustible and affordable form of energy. It can be used to cook food, heat water, and generate electricity. Solar energy conversion describes technologies devoted to the transformation of solar energy to other forms of energy, including electricity, fuel, and heat. Solar technologies convert sunlight into electrical energy either through photovoltaic (PV) panels or through mirrors that concentrate solar radiation.

[0003] A number of different types of bismuth ferrite properties analysis systems that are known in the prior art. For example, the following patents are provided as supportive teachings and are all incorporated by reference.

[0004] Auto-combustion synthesis of narrow band-gap bismuth ferrite nanoparticles for solar photocatalysis to remediate azo dye containing water: - Narrow band-gap ferrites makes it a good photocatalyst, and it plays a very prominent role in the level of degradation of organic dyes by photocatalysis. In the current study, bismuth ferrite (BFO) nanoparticles were synthesized by auto-combustion technique. The synthesized BFO particles have the average crystallite size of 33 nm and band gap energy of 2.1 eV. As revealed by microscopic images, uniform, distinct, and hexahedral shaped BFO nanoparticles of 42.7 nm are formed. The BFO nanoparticles exhibited visible solar light-mediated photocatalytic activity in degrading Acid Yellow-17. The optimum pH and catalyst loading were found to be pH 5 and 0.2 g/L respectively. Around 100% complete degradation under solar and 95% degradation under visible light could be achieved within 135 min of irradiation. Around 85% and 83% chemical oxygen demand (COD) removal could also be achieved under solar and visible light respectively. The degradation followed first-order kinetics in terms of COD removal. The BFO

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