Research Proposal

“Photocatalysis for water treatment by oxidation”

Abstract: When light strike on the semiconductor material the two phenomenon happens simultaneously 1. Oxidation from the photogenerated holes, 2. Reduction form the photogenerated electrons, with these two processes of oxidation and reduction can be used for lowering the contamination level of the water and atmosphere.

Introduction: Process oxidation and reduction of the semiconductor of holes and electrons, when UV solar light falls on the semiconductor plate, which can be used in various place like lowering of contamination level of natural water in wells, ponds, non-purified industrial waste of chemical industries and lab, oils refineries, including the medical and clinical apparatus. When UV rays falls on the semiconductor plate of the transition metal (copper, chromium iron, etc.), the oxidation from photogenerated holes and reduction of photogenerated electron takes place and this is the key concept to disinfect the bacteria, certain harmful chemical water such as mercury, arsenic and chromium which leads to lung cancers, skin disorders also renal effect.

Current research: The photocatalytic oxidative degradation of anthropogenic and natural organic contaminations i.e., pesticide, surfactant, organic fertilizer, chemical and oil industrial waste etc. to improve the efficiency of the semiconductor plate so that the rate as well as the efficiency of the degradation can be attaining to certain satisfactory level.

Challenges: The selection of the correct composition and appropriate nanostructure material which can easily get oxidised when the UV solar rays hit the surface of the semiconductor so, that we can achieve the satisfactory level of the degradation of the pollutants.