

## 2. Project Code: SLC-302

**Topic:** Use of TiO<sub>2</sub> nanoparticles for the degradation of dyes in waste water to save the environment

**Project Investigators:** Dr. Vijay Kr. Sharma (Dept. of Physics), Dr. Seema Dabas (Dept. of Physics) and Dr. Sanjay Kumar (Dept. of Chemistry)

**Summary:** Environmental pollutants are the major cause for most of the health illness. Water is the main source of contamination and pollution which effects health through biomagnifications. Water gets polluted by harmful chemicals, dye, oil etc. All the waste that water contains are due to harmful chemicals which are drained from factories and industries into water bodies. This causes water pollution and leads to various health issues to flora and fauna. Among the pollutants drained, the most important role is played by water dye. Most of the dyes released from pharmacy and textile industries are mutagenic, toxic and tetrogenic that can cause serious health hazards to humans and livestock. Dyes released in environment can impart color to water and also decrease or stop the capacity of water re-oxygenation by blocking the sunlight, thereby increasing its BOD value. Therefore, these conditions can prevent or disturb the growth of aquatic plants and animals. The color removal from waste water from industries is the main concern in the green chemistry.

By developing the nanoparticles of TiO<sub>2</sub>, we use them as photocatalyst to remove the color of dyes (organic pollutant) by which we can protect the marine life. We would further employ the use of TiO<sub>2</sub> nanoparticles even in the visible region of light and enhance its efficiency in the visible region of the spectrum.

Presently, the problem persisting is the degradation of TiO<sub>2</sub> nanoparticles only within the ultra-violet region of the spectrum which is only 4% of the solar light received on the earth and very less efficient when acted upon with the visible light. So, we wish to develop the technique which will be able to enhance the efficiency of degradation by broadening our study even to the visible light which comprises approximately about 50% of the sunlight.



### Detail of Students involved in Innovation Projects

Project No.	Project	Student's Name	Course's Name	Year
302	<b>“Use of TiO<sub>2</sub>, Nanoparticles for Degradation of Dyes in Waste Water to Save the Environment”</b> (Dr. Vijay Kumar Sharma, Dr. Seema Dabas and Dr. Sanjay Kumar)	Utkarsh Gupta	B.Sc.(H) Physics	III
		Faheem Khan Pathan	B.Sc.(H) Physics	III
		Kaushal Kumar Thakur	B.Sc.(H) Physics	III
		Shruti Pandey	B.Sc.(H) Chemistry	III
		Raju Khan	B.Sc.(H) Physical Sc.	II
		Ashish Sharma	B.Sc.(H) Physical Sc.	II
		Shipra Gupta	B.Sc.(H) Physical Sc.	II
		Hemlata	B.Sc.(H) Physical Sc.	II
		Mritunjaya Parashar	B.Sc.(H) Physical Sc.	II
		Nuzhat Saba	B.Sc.(H) Physical Sc.	II