
Departmental Seminar

Seminar Title	: Conference Return Seminar : Bi2S3/G-C3N4 NANOCOMPOSITE BASED PHOTOCATALYSIS FOR DEGRADATION OF METHYLENE BLUE.
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Venue	: CE Seminar Hall
Date and Time	: 11 Mar 2025 (4 p.m)
Abstract	: The emergence of industrial activities in various fields such as textiles, cosmetics, and paper has resulted in the widespread discharge of synthetic dyes into waterbodies, which pose ecological and human health risks. Conventional wastewater treatments are not efficient enough to degrade these pollutants. In this respect, Advanced Oxidation Processes (AOPs), including photocatalysis, can be proposed as environmentally friendly and effective solutions for the treatment of wastewater using oxidative species in the treatment process. This study aimed at developing a novel Bi2S3/g-C3N4 nanocomposite using bismuth nitrate, urea, and thiourea for the photocatalytic degradation of Methylene Blue (MB), a representative dye contaminant, using solar radiation. The nanocomposite was characterized by XRD, FESEM, and FTIR to establish the structure, morphology and functionality of the nanocomposite. The photocatalytic activity of the Bi2S3/g-C3N4 nanocomposite was investigated by irradiating the catalyst with sunlight in the presence of Peroxymonosulphate (PMS) as an activator. The results indicated a very high MB degradation of 98.8% with 1 mg/l catalyst dose and in 10 mg/l MB concentration in 45 minutes of degradation time. The effects of initial MB concentration, photocatalyst dose, and solution pH on the degradation process were also investigated. The optimal conditions were obtained at the catalyst concentration of 0.7 g/L and initial MB concentration of 10 mg/L, and the removal efficiency was 98.5% in 45 minutes of reaction time. Moreover, the present work showed that the degradation efficiency is higher in basic pH range, and a highest efficiency of 99.3% was obtained at pH 12 in 45 minutes. These results indicate that the Bi2S3/g-C3N4 nanocomposite has a high potential to act as promising photocatalyst for the treatment of MB.