

Departmental Seminar

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Seminar Title	: Conference Return Seminar(6th International Conference on Applications of Fluid Dynamics (ICAFD)) on Development of Dimensional Analysis Correlations for Hydrodynamic Characteristics of a Three-phase Annular Fluidized Bed with Low Density Integrated Photocatalytic Adsorbent (IPCA) Particles
Speaker	: Mr. Pedina Sibakrishna (Phd, Roll No. 519ch1009)
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Venue	: New Seminar Room, Department of Chemical Engineering
Date and Time	: 11 Dec 2024 (4.00 p.m.)
Abstract	: In this work, the hydrodynamic behaviour of a three phase annular fluidized bed with low-density integrated photocatalytic adsorbent (IPCA) particles is characterized and correlations are developed based on dimensional analysis. This is done to enable successful design and operation of a three phase annular fluidized bed (TPAFB) photocatalytic reactor that is a promising device for photocatalytic degradation of pollutants from wastewater. The solid particles used are TiO <sub>2</sub> supported integrated granular activated carbon prepared from waste coconut shells (TiO <sub>2</sub> /CSGAC) as this integrated photocatalytic adsorbent gives synergistic effect due to adsorption assisted photocatalytic degradation in treating wastewater. Air and water are used as gas and liquid phase respectively. The operating variables like superficial gas and liquid velocity, average particle size, initial static bed height, and liquid viscosity are varied to study the hydrodynamics. The hydrodynamic parameters characterized include bed pressure drop, minimum liquid fluidization velocity, bed expansion and fractional gas holdup. The correlations developed for hydrodynamic characteristics have been approximated accurately with the experimental results. Keywords: Three-phase annular fluidized bed, Photocatalytic Reactor, integrated photocatalytic adsorbent, Hydrodynamic Characteristics, Correlations