Enhancement photocatalytic activity of the heterojunction of two-dimensional hybrid semiconductors ZnO/V2O5

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 In this work, we report the fabrication of the new heterojunction of two 2D hybrid layered semiconductors?ZnO (stearic acid)/V2O5 (hexadecylamine)?and its behavior in the degradation of aqueous methylene blue under visible light irradiation. The optimal photocatalyst efficiency, reached at a ZnO (stearic acid)/V2O5 (hexadecylamine) ratio of 1:0.25, results in being six times higher than that of pristine zinc oxide. Reusability test shows that after three photocatalysis cycles, no significant changes in either the dye degradation efficiency loss, nor the photocatalyst structure, occur. Visible light photocatalytic performance observed indicates there is synergetic effect between both 2D nanocomposites used in the heterojunction. The visible light absorption enhancement promoted by the narrower bandgap V2O5 based components; an increased photo generated charge separation favored by extensive interface area; and abundance of hydrop