The well controlled fabrication of supported bimetallic nanoparticles has inspired material scientists in the design of new methodologies [1]. This study presents a systematic approach for the synthesis, characterization (TEM, XPS, XRD, UV-Vis), and evaluation of bimetallic nanoparticles Pd-Au supported on Titania-P90 which are highly active and selective in photocatalytic oxidation of methanol to methyl formate. To achieve this goal, we have combined the structural and surface effect of different components using the SonoPhotodeposition advanced methodology (Figure)[2].

We strongly believe that the strong metal support interaction effect between Pd-Au alloy nanoparticles and TiO$_2$ surface (for the best photocatalyst) is one of the reasons for such good activity and selectivity [3]

[1] Zhi-cheng Zhang et al., Chemical Society Reviews, 2014, 43, 7870-7886

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