

Porous silicon layer decorated with PbS nanoparticles by SILAR method for enhanced photocatalytic degradation of amido black dye	
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<p>Abstract: The effect of lead sulfide (PbS) decoration on the photocatalytic properties of porous silicon (PS) was investigated. The PbS nanoparticles (PbS-NPs) are prepared by the successive ionic layer adsorption and reaction method (SILAR). The microstructure, surface morphology, phase composition, and optical properties of the prepared structure were characterized using X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM and high-resolution mode HRTEM), and UV–Vis spectroscopy respectively. The PbS nanoparticle properties were altered by changing the SILAR cycles number (10 to 60 cycles) permitting a well-control of PbS-NP size and density. The synthesized nanohybrid system photocatalytic activity was investigated via the degradation of amido black dye (AB) as a pollutant model. The tested structures showed that the best enhancement of the photocatalytic removal of AB was reached with PbS-NPs deposited during 60 SILAR cycles with a reaction rate of 0.01096 min⁻¹, exceeding that of pure PS layer..</p>	