

**OPTICAL SENSING MATERIAL BASED ON HYBRID SOL-GEL/PVA
FOR CADMIUM DETECTION**

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ABSTRACT

OPTICAL SENSING MATERIAL BASED ON HYBRID SOL-GEL/PVA FOR CADMIUM DETECTION

In this study, Alizarin Red S (ARS) reagent was used to detect cadmium (Cd^{2+}) in free solution and immobilization form. For free solution, six parameters has been studied, effect of pH, effect of reagent concentration, photostability, dynamic range, reproducibility and interferences. ARS complex showed maximum absorption at 424.50 nm and pH 6. Photostability of ARS reagent showed RSD value of 1.77 %. The reproducibility gives RSD values of 1.23 % and 2.89 % for the concentration of 1 ppm and 5 ppm, respectively. ARS gave linear response in the cadmium concentration range of 0 – 5 ppm. For the immobilization form, five parameters that have been studied were the effect of ARS loading amount in the sol-gel, observation on the different transparency film, leaching test, photostability and reproducibility. Hybrid sol-gel/PVA film was able to produce good film compare to pure sol-gel and PVA film. Photostability of ARS reagent showed RSD value of 2.19 %. The reproducibility gave RSD values of 29.72 % and 20.39 % for cadmium concentration of 5 ppm and 10 ppm respectively.