Detection of Bisphenol A from drinking water in plastic bottles using film coated by silver nanoparticles

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Bisphenol A (BPA) is an industrial chemical which can be used as the precursor to produce polycarbonate (PC) plastic for drinking water bottles. Several studies found that BPA causes a number of health problems and diseases such as prostate and breast cancer, abnormalities in reproductive system and problems in baby position in womb, etc. This project aims to develop the simple, low-cost and short time method for the detection of BPA from drinking water in plastic bottles. The water-resistant film coated by the modified silver nanoparticles is expected to be applied with colorimetric method in this work. The film will be made by Polyvinyl Alcohol (PVA) and Chitosan as the main ingredients. Silver nanoparticles will also be synthesized by the general method through $NaBH_4$ reduction and further modifications before use. DLS will be used to control the sizes of the nanoparticles. UTM and FTIR will be employed to study physical properties of the film. For users' convenient observation, the films with different physical morphologies will be tested several times with different concentrations of BPA to find the most suitable condition for obvious visualization in changing color of the film.