

Colorimetric Detection of Melamine in Milk Sample by Using In-Situ Formed Silver Nanoparticles by Tannic Acid

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Abstract : Melamine toxicity which causes renal failure and death of humans and animals have recently attracted worldwide attention. Developing an easy, fast and sensitive method for the routine melamine detection is the need of the hour. Herein, we have developed a rapid, sensitive, one step and selective colorimetric method for the detection of melamine in milk samples based upon in-situ formation of silver nanoparticles (AgNPs) via tannic acid at room temperature. These AgNPs thus formed were characterized by UV-VIS spectrophotometer, transmission electron microscope (TEM), zetasizer and dynamic light scattering (DLS). Under optimal conditions, melamine could be selectively detected within the concentration range of 0.05-1.4 μ M with a limit of detection (LOD) of 10.1 nM, which is lower than the strictest melamine safety requirement of 1 ppm. This assay does not utilize organic cosolvents, enzymatic reactions, light sensitive dye molecules and sophisticated instrumentation, thereby overcoming some of the limitations of conventional methods.

Keywords : milk adulteration, melamine, silver nanoparticles, tannic acid

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