Electronic Supplemental Sections (ESM)

TEM analysis (Φ):

The morphology of the ZnO/CuO/Co_3O_4 nanoparticles material was characterized by recording TEM images as shown in Fig. S1 (a-b). It can be seen that ZnO/CuO/Co_3O_4 material exists as nanoparticles having average diameter of 63.4 nm in the range of 51.0 to 72.0 nm. It is clearly shown the aggregated ternary nanoparticle forms as ZnO/CuO/Co_3O_4. This observation implies that ZnO/CuO/Co_3O_4 NPs would provide a large surface area which thus might be helpful for the efficient sensing of melamine molecules.

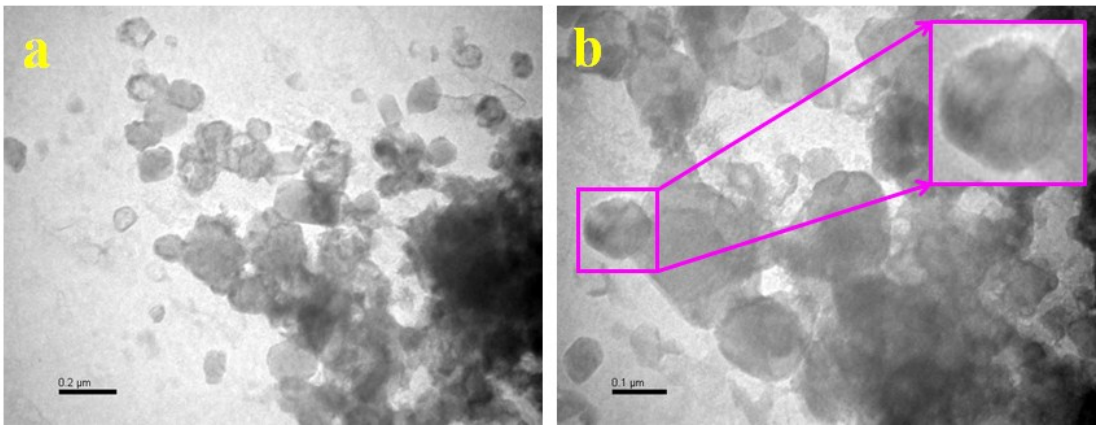

Fig. S1: TEM images of ZnO/CuO/Co_3O_4 NPs (a-c) Low-to-high magnified images.

Control experiment (Ψ):

A control experiment has been performed in presence of melamine, urea, starch, glucose separately in identical conditions. All analytes concentration were kept constant as 5.0 nM in PBS system and presented in Fig. S2. It is observed the highest current response towards the melamine with ZnO/CuO/Co3O4 nanoparticles sensor probe compared to other analytes. From the Fig. S2, if melamine shows 100% (based on current response), then other analytes such as urea, glucose, and starch shows 32.3%, 23.5%, and 14.7% respectively. So, ZnO/CuO/Co3O4 nanoparticles sensor probe is selective towards the detection of melamine at room conditions.

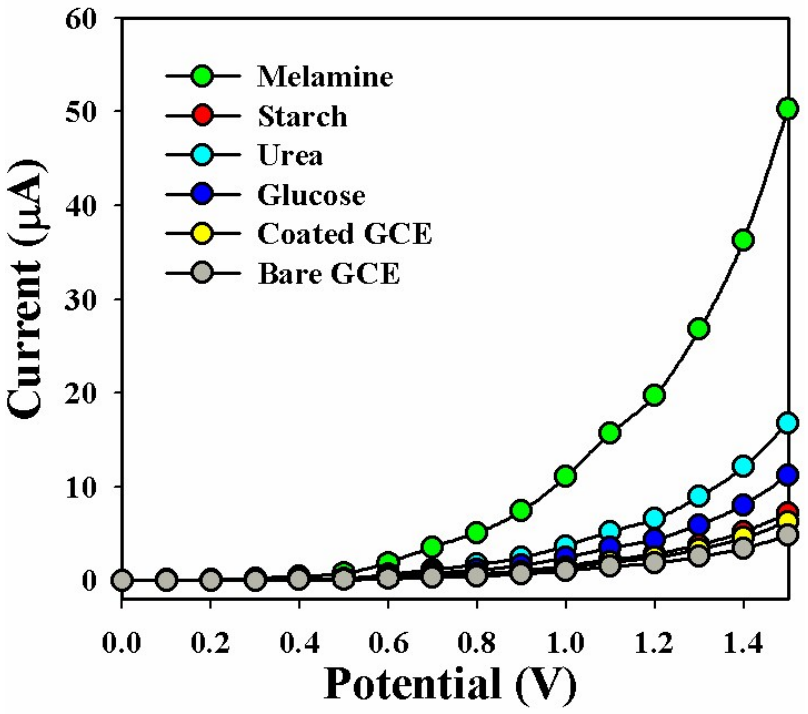

Fig. S2: Control experiment with the ZnO/CuO/Co3O4 nanoparticles sensor probe for the detection of melamine, starch, urea, glucose by electrochemical method. Analyte concentration is 5.0 nM.