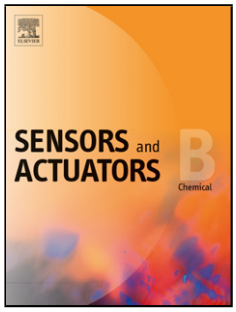

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Graphical Abstract

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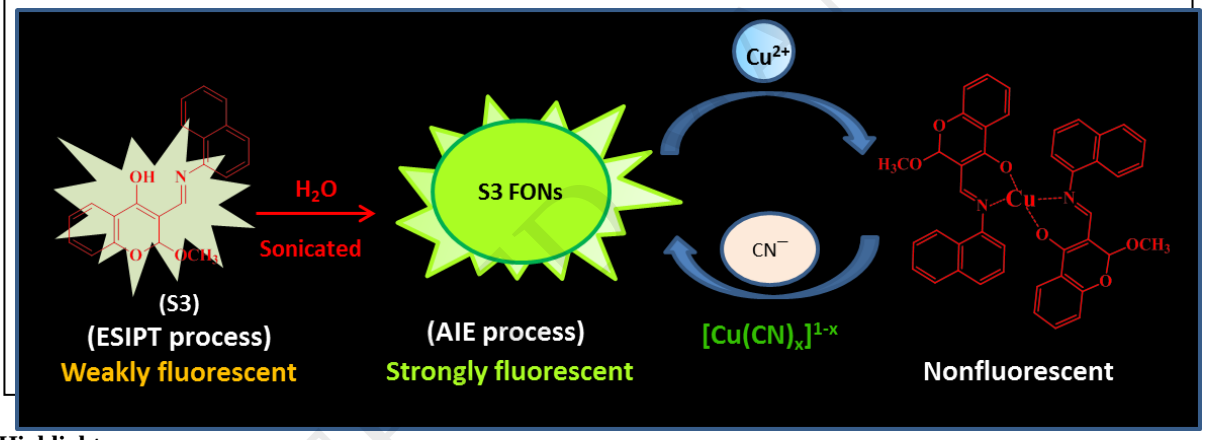

Highlights:

- Novel multidentate probes S3 and S4 were synthesized and characterized.
- S3 was further developed as AIE based fluorescent organic nanoparticles.
- S3-FONs acted as efficient primary sensor for Cu^{2+} (turn OFF) and a potential secondary sensor for CN^- (turn ON).
- The proposed sensor detects the nanomolar concentrations of both of the ions.
- IMPLICATION logic gate and cellular imaging applications.