**Abstract**

A quinoline-pyrazoline (QTP) module has been designed, synthesized and characterized as a fluorescence sensor for sequential detection of Cu2+ and S2− ions. The dual functional probe showed “on-off-on” property through displacement approach and because of fast kinetics between Cu2+ and S2− ion. Fluorescence imaging experiments with MG 63 cell lines exclusively demonstrate the applicability of Cu (II) imaging in biological systems. It is also used for the real-time analysis of sulphide ion in tannery effluent for environmental monitoring.