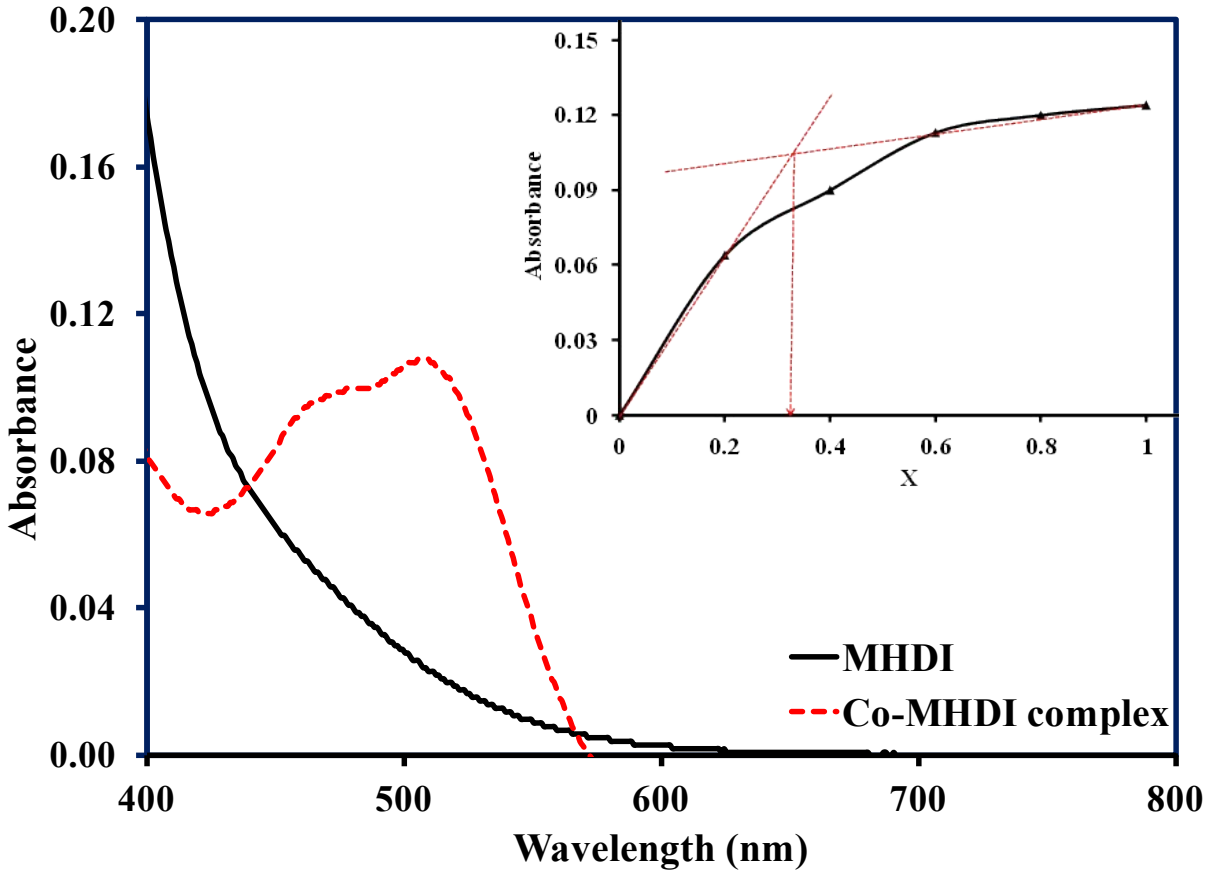
SUPPLEMENTARY INFORMATION (SI)

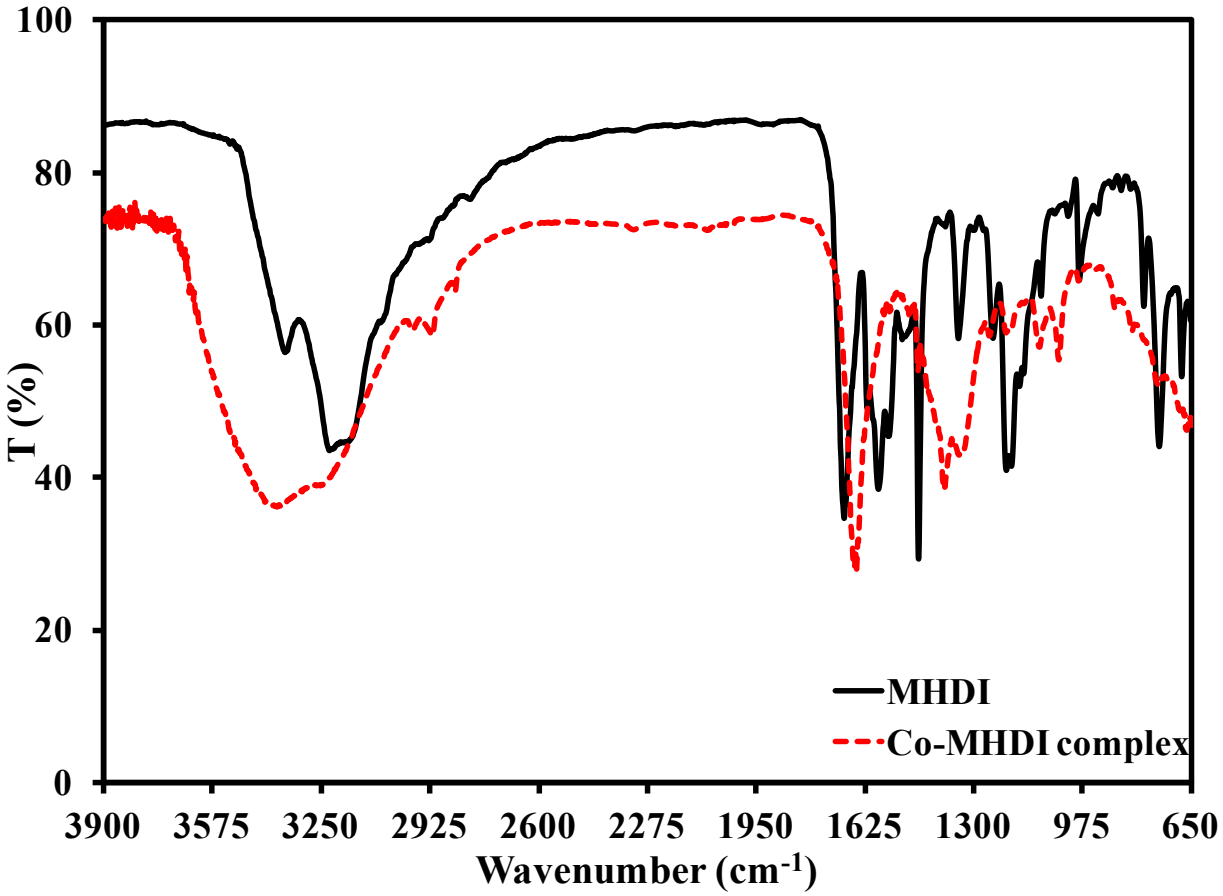
SI-1: Spectroscopic characterization of MHDI and its Co complex



A) UV-Vis. spectra for the reagent MHDI and its complex with Co^{2+}. Inset-B denotes Job's plot.

The reagent MHDI (SI-1a, b) presents in two tautomeric forms i.e., *keto* and *enol* where in the solution the latter (enol form) is more predominant in complex formation with Co^{2+} producing the final end product (SI-1c). The UV-Vis spectra of the reagent MHDI showed two transitions at 3.3 $\times 10^4$ and 2.3×10^4 cm^{-1} and were safely assigned to $\pi \rightarrow \pi^*$ and $\pi \rightarrow \pi^*$ electronic transition at 3.3×1^4 and 2.3×1^4 cm^{-1} (SI-2A) [1], respectively. On complex formation with Co^{2+}, the electronic spectrum showed two energy transitions at 2.13 $\times 10^4$ and 2.0×10^4 cm^{-1} corresponding to internal ligand $\pi \rightarrow \pi^*$ and charge transfer transition (O $\rightarrow$ Co) and color

change were noticed indicating strong interaction between Co^{2+} centers (Co-Co) in octahedral planar geometry [2]. Three spin allowed d→ d transitions assigned to$^4T_{1g}$→ $^4A_{2g}$ υ_1 (d_{x2-y2}→d_{z2}^2), ^{4}T1g(F)→ ^{4}T1g (P) υ_2 (d_{x2-y2}→d_{xy}) d-d transitions are noticed in octahedral planar Co^{2+} complex (SI-2A) [2, 3]. Assuming formation of one complex species of Co^{2+} and based on the methods of continuous variations and molar ratio data (SI-2A, inset) [4], it can be concluded that, formation of 1:2 Co^{2+} to MHDI molar ratio is achieved. Thus, the most probable structure of Co^{2+}complex is $CoL_2(H_2O)_2$ (where L= MHDI) as shown in SI-1c.

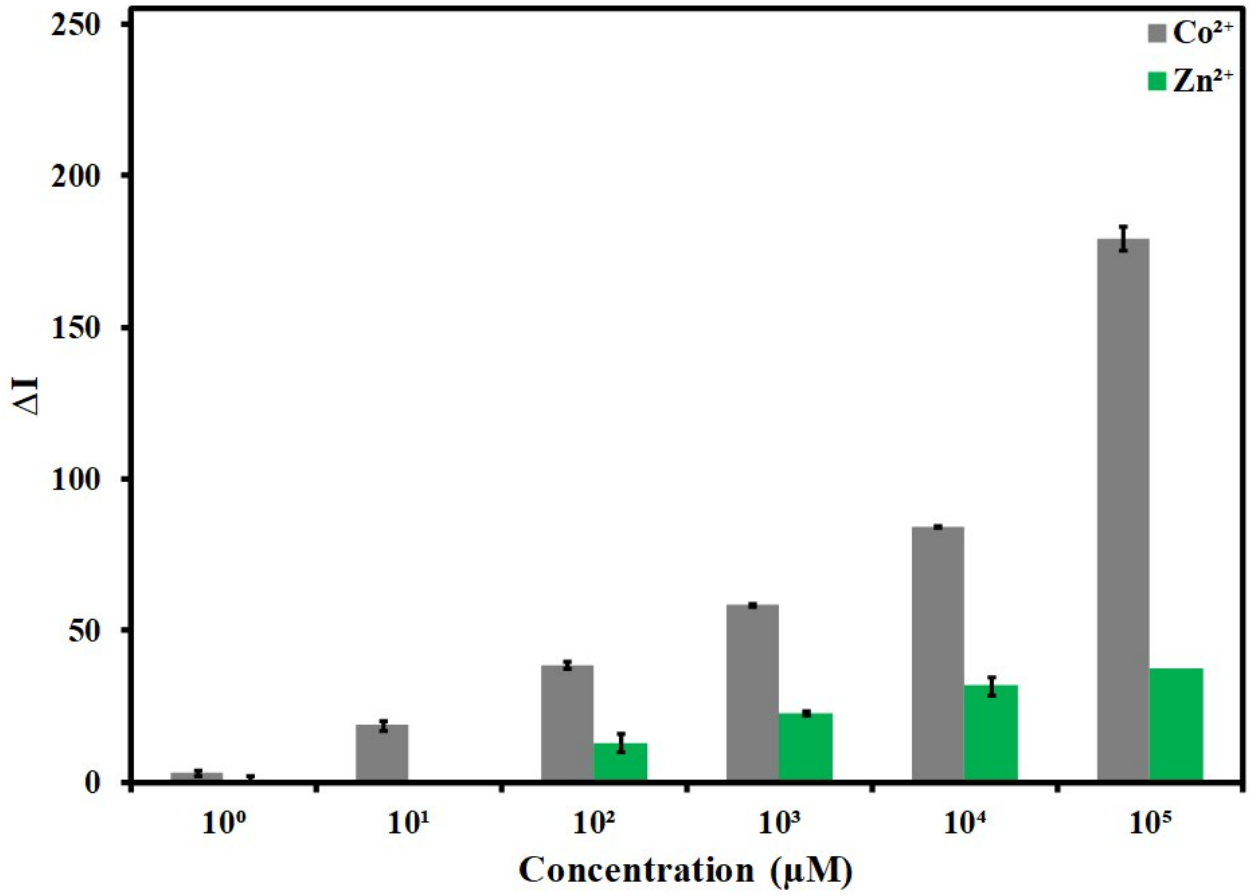


B) FTIR spectra for the reagent MHDI and its complex with Co^{2+}.

The most important FTIR vibrations of MHDI and its Co^{2+} complex are presented (SI-2B). The reagent spectrum showed vibrations at 3400 (υ OH), 3250 (υ NH), 1700 (υ C=O) and 1580 (υ C=N) cm^{-1} [5]. The characteristics infrared (FTIR) spectra of MHDI reagent was changed after

its reaction with Co^{2+}. The bands at 3025 and 3085 cm^{-1} for ν(C-H) in the FTIR spectrum of the free reagent remained unchanged even after complex formation whereas the band at 3400 cm^{-1} due to ν(O-H) was shifted to 3240 cm^{-1} upon complex formation via hydroxyl group [5]. Complex formation was further confirmed by the participation of the ν (-C=N-) N atom of the free MHDI with the Co^{2+}. The vibrations at 523 and 418 cm^{-1} were assigned to ν (Cu-N) and (Cu-O) in the FTIR spectrum of the complex.

SI-2: Comparison of Co^{2+} and Zn^{2+} assay on the developed platform



SI-3: Composition of real water samples based on ICP-OES analysis.

Analytes (mg/L)	Tap water (TW)	Industrial wastewater (IWW)
Ag	BDL*	BDL
Al	BDL	BDL
B	0.366	0.08
Ba	BDL	BDL
Ca	13.10	34.25
Cd	BDL	BDL
Co	BDL	0.102**
Cr	BDL	BDL
Cu	BDL	0.24
Fe	BDL	BDL
K	0.82	21.75
Mg	0.47	14.05
Mn	BDL	0.004
Ni	BDL	BDL
Pb	BDL	BDL
Zn	BDL	BDL

*BDL: Below detection limit
** 0.102 mg/mL=1.73 μM

References:

[1] Ramachandran, R., Prakash, G., Selvamurugan, S., Viswanathamurthi, P., Malecki, J. G., Linert, W., Gusev, A., *RSC Advances* 2015, *5*, 11405-11422.

[2] Lever, A. B. P., *Inorganic electronic spectroscopy*, Elsevier 1984.

[3] Basuli, F., Peng, S.-M., Bhattacharya, S., *Inorganic Chemistry* 2001, *40*, 1126-1133.

[4] Sawyer, D. T., Heinemann, W. R., Beebe, J. M., *Chemistry Experiments for Instrumental Methods*, John Wiley & Sons 1984.

[5] Nakamoto, K., *Infrared and Raman Spectra of Inorganic and Coordination Compounds*, Wiley Interscience, New York 1971.