Synthesis of a dihydroquinoline based fluorescent cyanine for selective, naked eye, and turn off detection of Fe$^{3+}$ ions.
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1 Detection Limit Calculation

The detection limit of probe 8 for Fe$^{3+}$ was estimated to be of $20.2 \times 10^{-9}$ M. To establish the detection limit, a graph of minimum equivalents of Fe$^{3+}$ versus fluorescence intensity was plotted. The point where a good sensitivity was observed was obtained by extrapolating the lines.

Equation used for calculating detection limit (DL)

Detection Limit = Conc. of probe 8 x Equiv. of titrant at which change observed.

Therefore;

$DL = 9.13 \times 10^{-7} \times 0.02 = 20.2 \times 10^{-9}$ M.

2 Fluorescence Study
Fluorescence response curve of probe 8 (9.13 x 10^{-7} M) on mixing with 10 equivalents of various metals.

The metals tested were from the corresponding compounds of AgNO\textsubscript{3}, AlCl\textsubscript{3}, BaCl\textsubscript{2}.2H\textsubscript{2}O, CaCl\textsubscript{2}, CdCl\textsubscript{2}.5H\textsubscript{2}O, CoCl\textsubscript{2}.2H\textsubscript{2}O, CrCl\textsubscript{3}.6H\textsubscript{2}O, CsCl, CuCl, CuCl\textsubscript{2}, FeCl\textsubscript{2}.4H\textsubscript{2}O, HgCl\textsubscript{2}, InCl\textsubscript{3}, KCl, LiCl, MgCl\textsubscript{2}.6H\textsubscript{2}O, MnCl\textsubscript{2}.2H\textsubscript{2}O, NaCl, NiCl\textsubscript{2}.6H\textsubscript{2}O, PbCl\textsubscript{2}, SbCl\textsubscript{3}, SnCl\textsubscript{2}.2H\textsubscript{2}O, SrCl\textsubscript{2}.6H\textsubscript{2}O, and ZnCl\textsubscript{2}.
3 NMR Spectra

i. 1,2,2,4-Tetramethyl-1,2-dihydroquinoline

![NMR spectrum of 1,2,2,4-Tetramethyl-1,2-dihydroquinoline]

ii. 1,2,2,4-Tetramethyl-1,2-dihydro-6-quinolinecarbaldehyde

![NMR spectrum of 1,2,2,4-Tetramethyl-1,2-dihydro-6-quinolinecarbaldehyde]
iii. $^1$HNMR of 7-methyl-2-phenylimidazo[1,2-a]pyridine

![HNMR spectrum of 7-methyl-2-phenylimidazo[1,2-a]pyridine](image)

iv. $^{13}$CNMR of 7-methyl-2-phenylimidazo[1,2-a]pyridine

![CNMR spectrum of 7-methyl-2-phenylimidazo[1,2-a]pyridine](image)
v. $^1$HNMR of 7-methyl-2-phenylimidazo[1,2-a]pyridinium iodide

vi. $^{13}$CNMR of 7-methyl-2-phenylimidazo[1,2-a]pyridinium iodide
vii. $^1$HNMR of (E)-1-methyl-2-phenyl-7-(2-(1,2,2,4-tetramethyl-1,2-dihydroquinolin-6-yl)vinyl)imidazo[1,2-a]pyridin-1-ium iodide:

![HNMR spectrum image]

viii. $^{13}$CNMR of (E)-1-methyl-2-phenyl-7-(2-(1,2,2,4-tetramethyl-1,2-dihydroquinolin-6-yl)vinyl)imidazo[1,2-a]pyridin-1-ium iodide:

![CNMR spectrum image]