

## Benzimidazole-Modified Organosilane: A 'Turn-off' Fluorescent Probe for Highly Selective Cu<sup>2+</sup> Ion Detection - Unravelling Logic Gate Behaviour and Molecular Docking Studies

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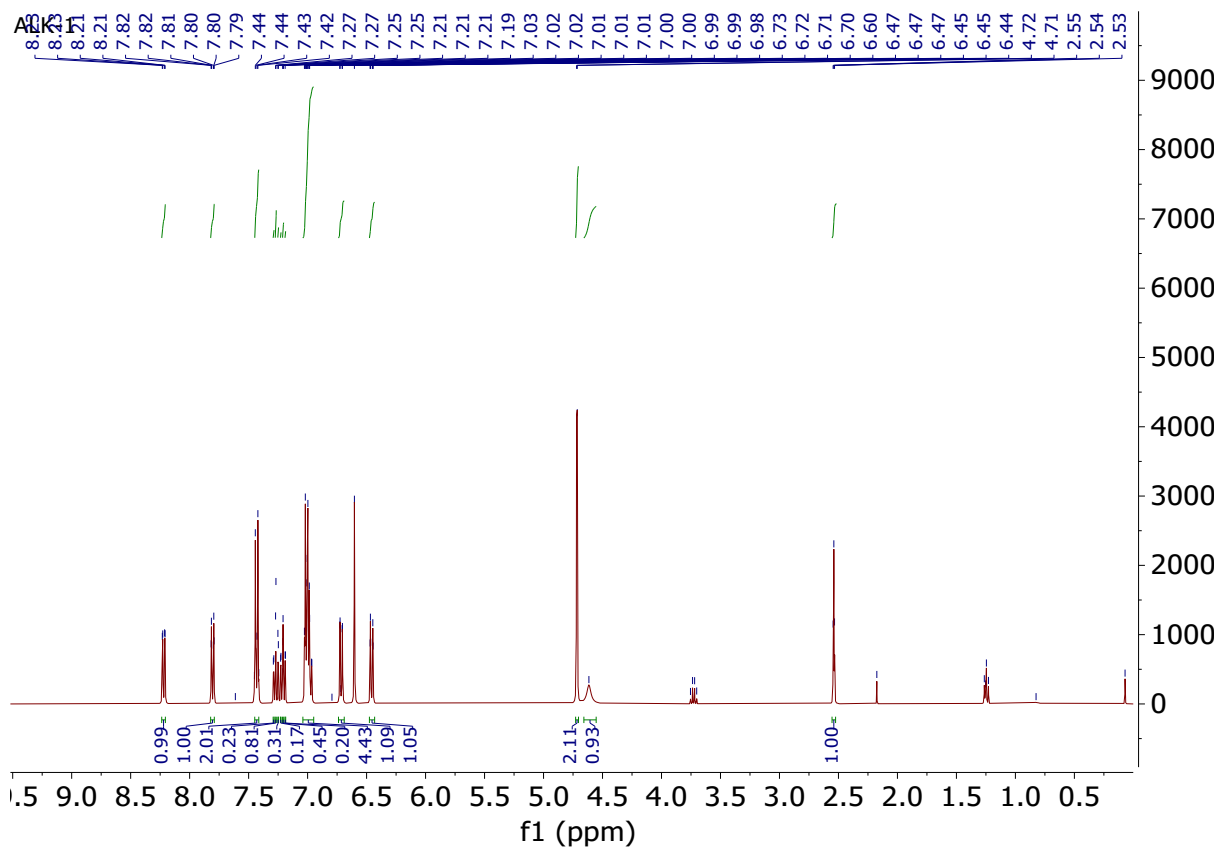


Fig.S1  $^1\text{H}$  NMR spectrum of compound 4

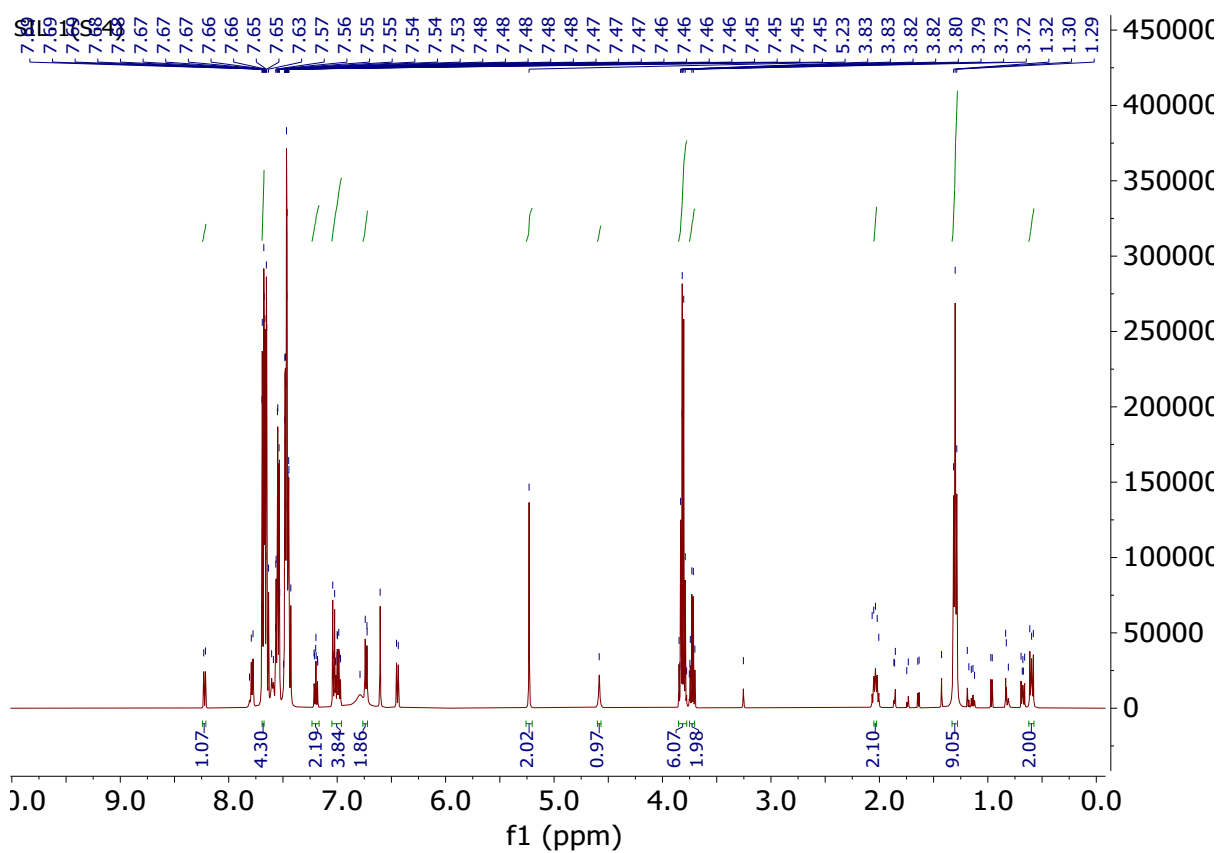


Fig.S2  $^1\text{H}$  NMR spectrum of compound 5

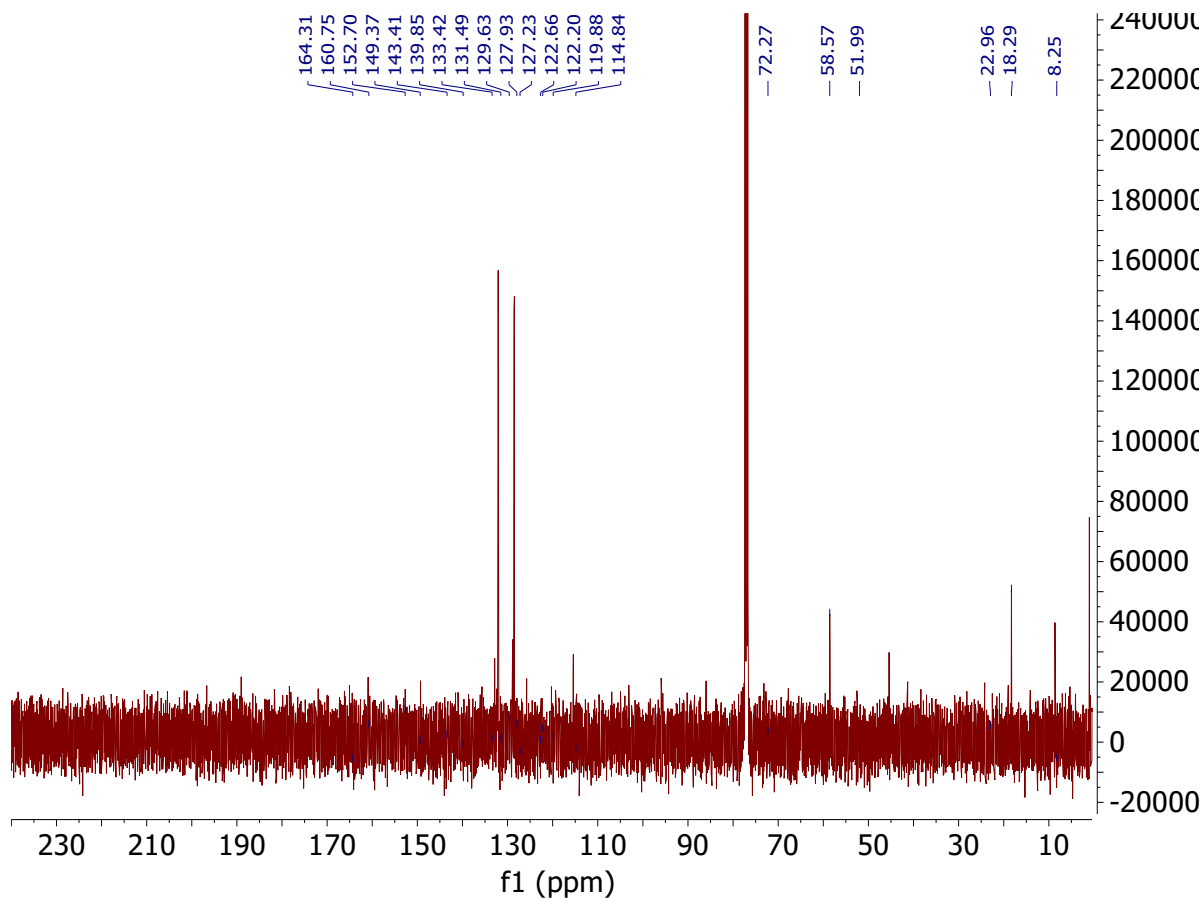


Fig.S3  $^{13}\text{C}$  NMR spectrum of compound 5

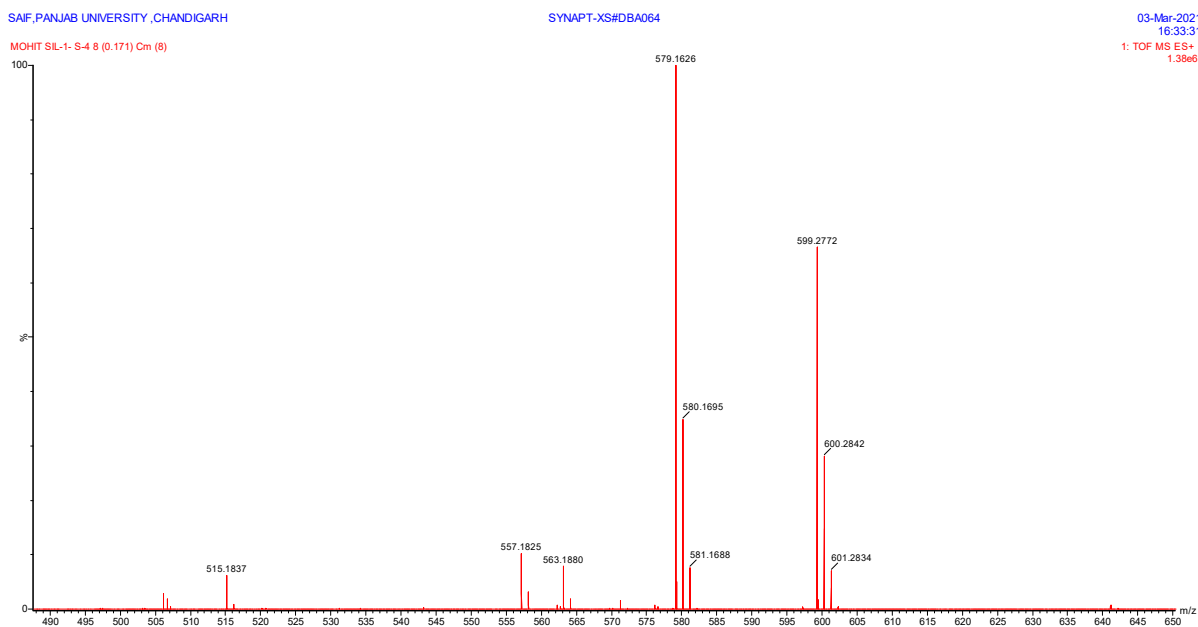


Fig.S4 Mass spectrum of compound 5

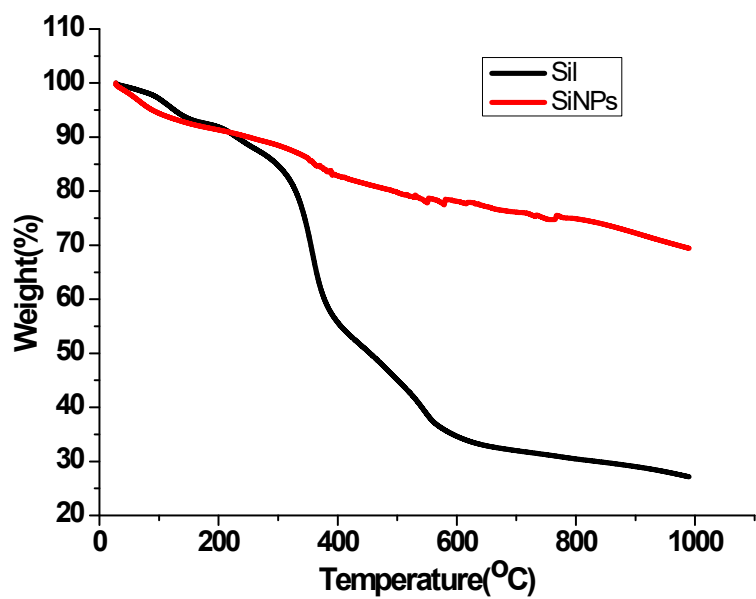


Fig. S5: TGA curves for Silane and H-NPs

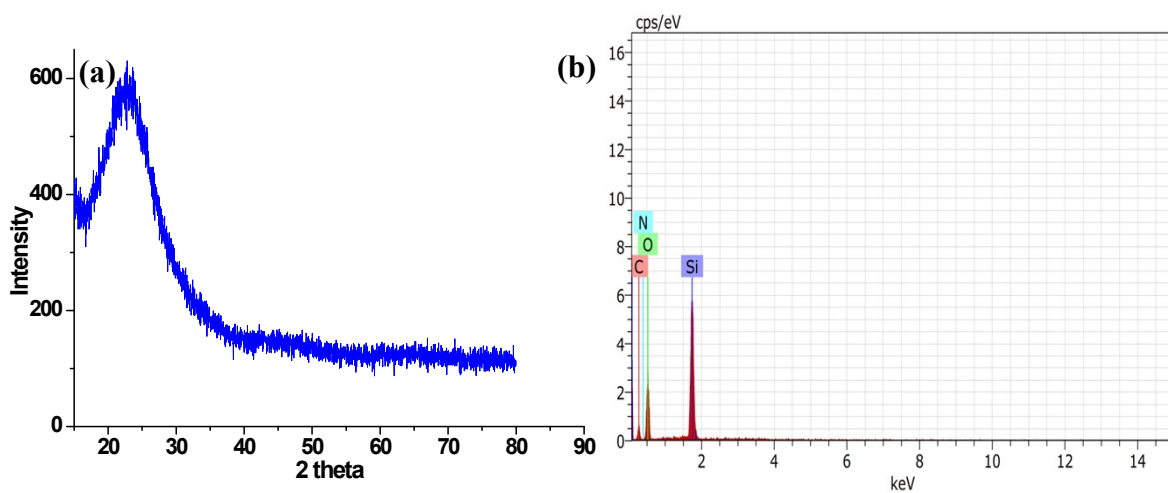


Fig. S6: XRD of H-NPs @ EDX pattern of H-NPs (b)

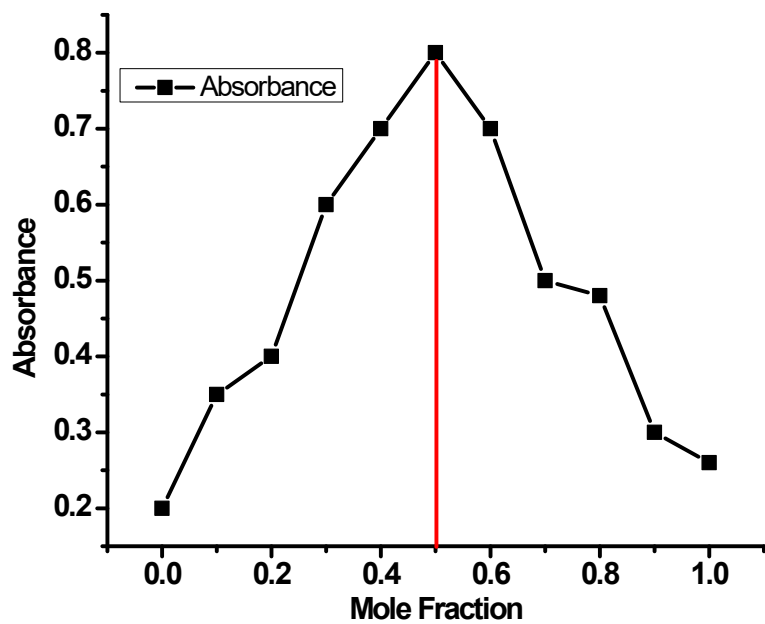


Fig. S7: Job's plot for compound (5)

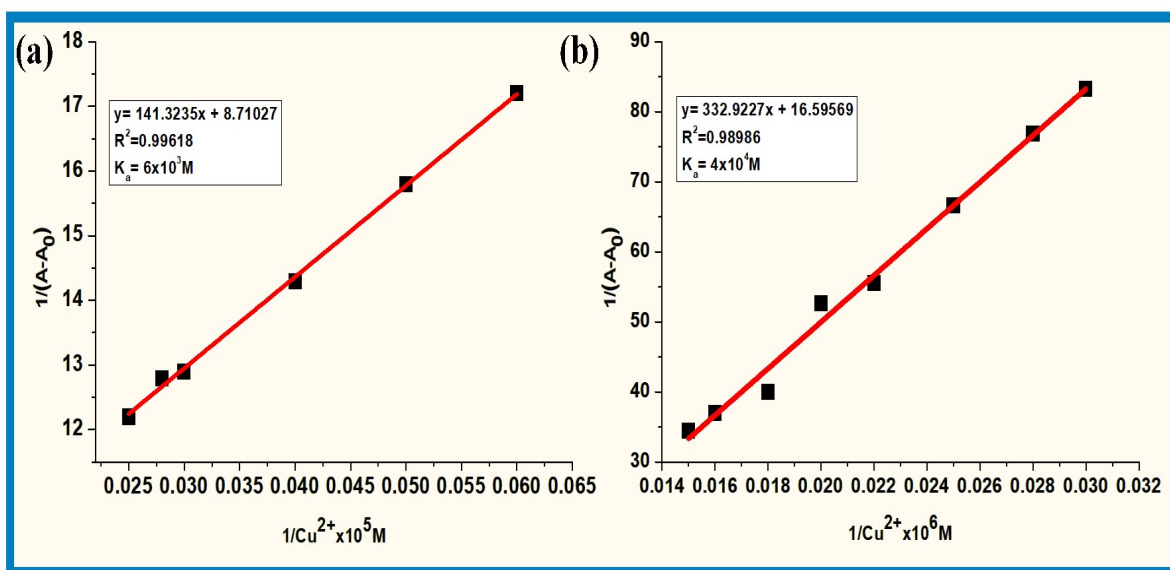
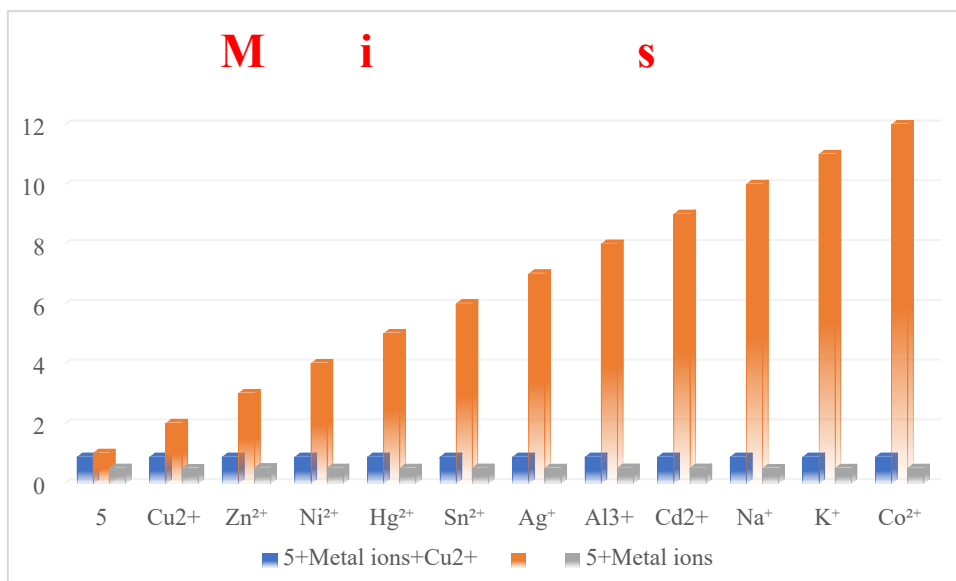
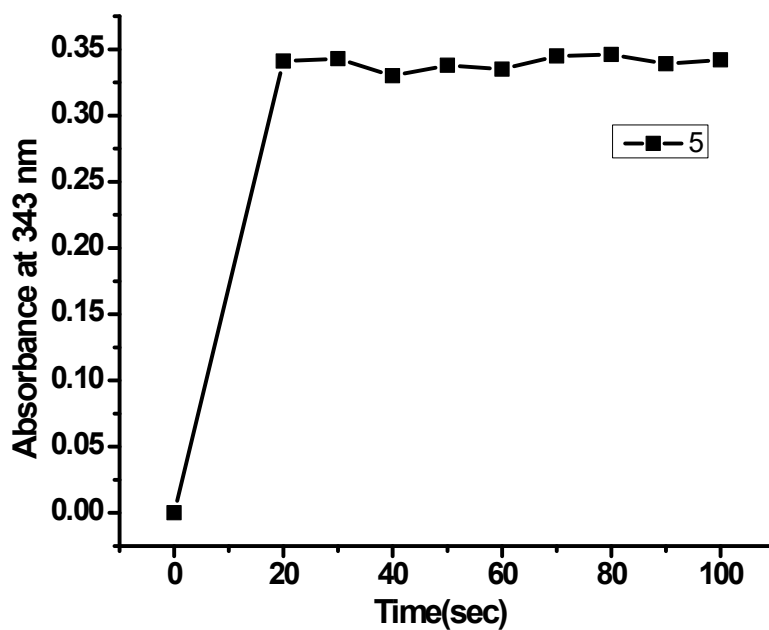


Fig S8: B-H curve for compound 5a (a) B-H curve for H-NPs (b)



**Fig S9:** Interference study of ligand(5a) + Cu<sup>2+</sup> in the presence of other metal ions



**Fig S10:** Time response study of compound (5)

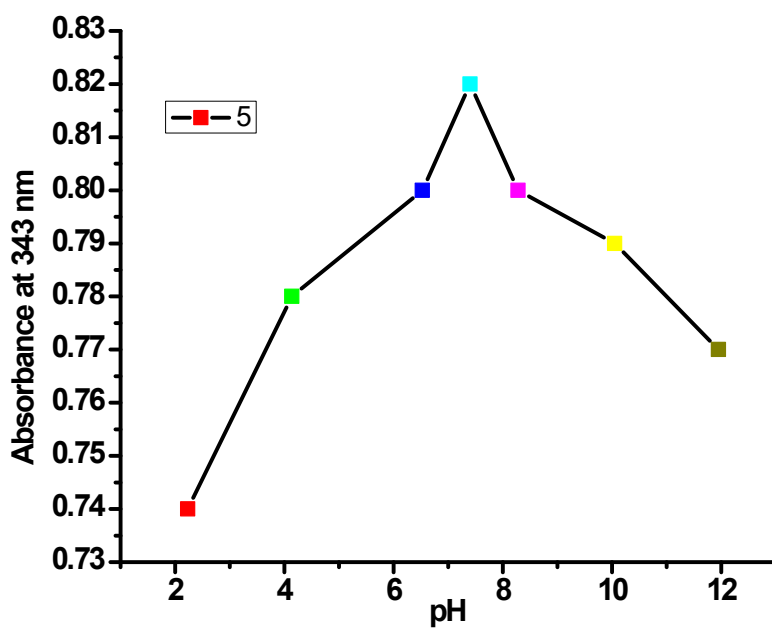


Fig S11: pH dependence study of compound (5)

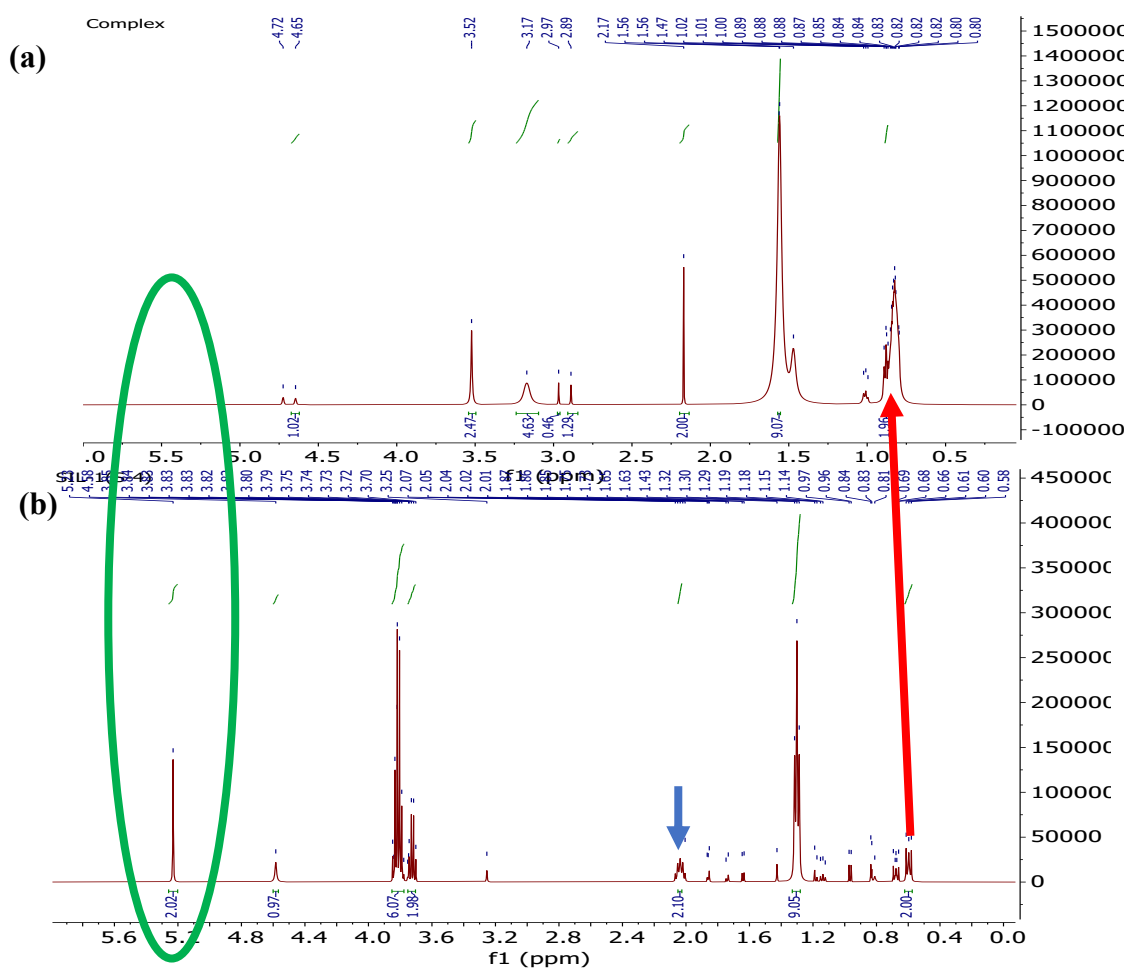
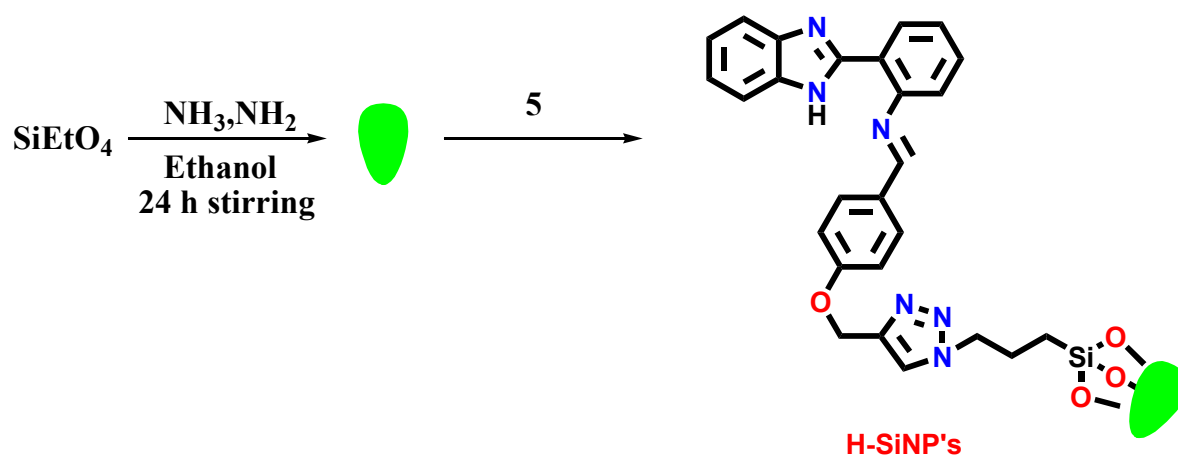
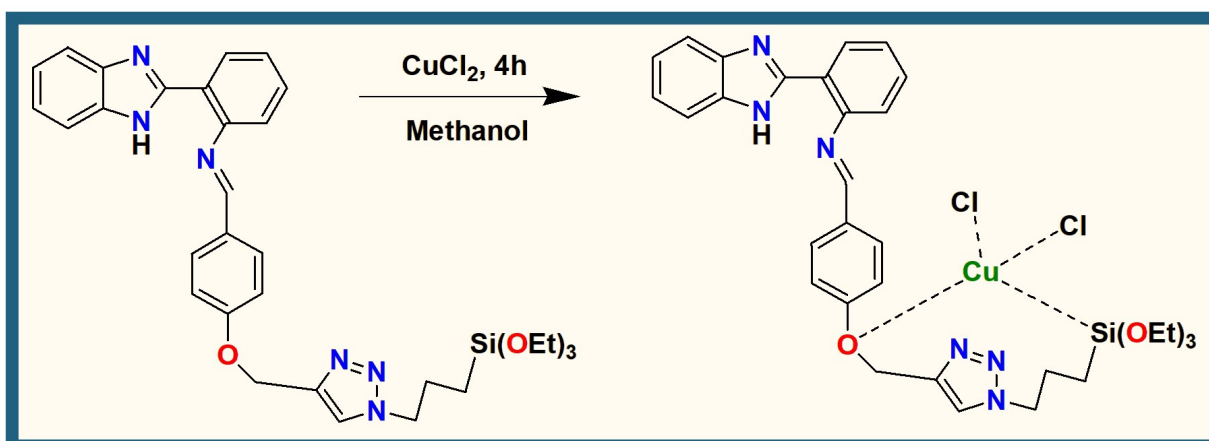


Fig. S12: NMR spectra of 5 (b) and complex (a)



**Scheme S1:** Modification of silica surfaces with silane 5



**Scheme S2:** Synthesis of complex