Electronic Supplementary Material (ESI) for RSC Advances.

Precursor Engineering for Soft Selective Synthesis of Phase Pure Metal-Rich Digenite (Cu_9S_5) and Djurleite ($Cu_{31}S_{16}$) Nanocrystals and Investigation of Their Photo-Switching Characteristics

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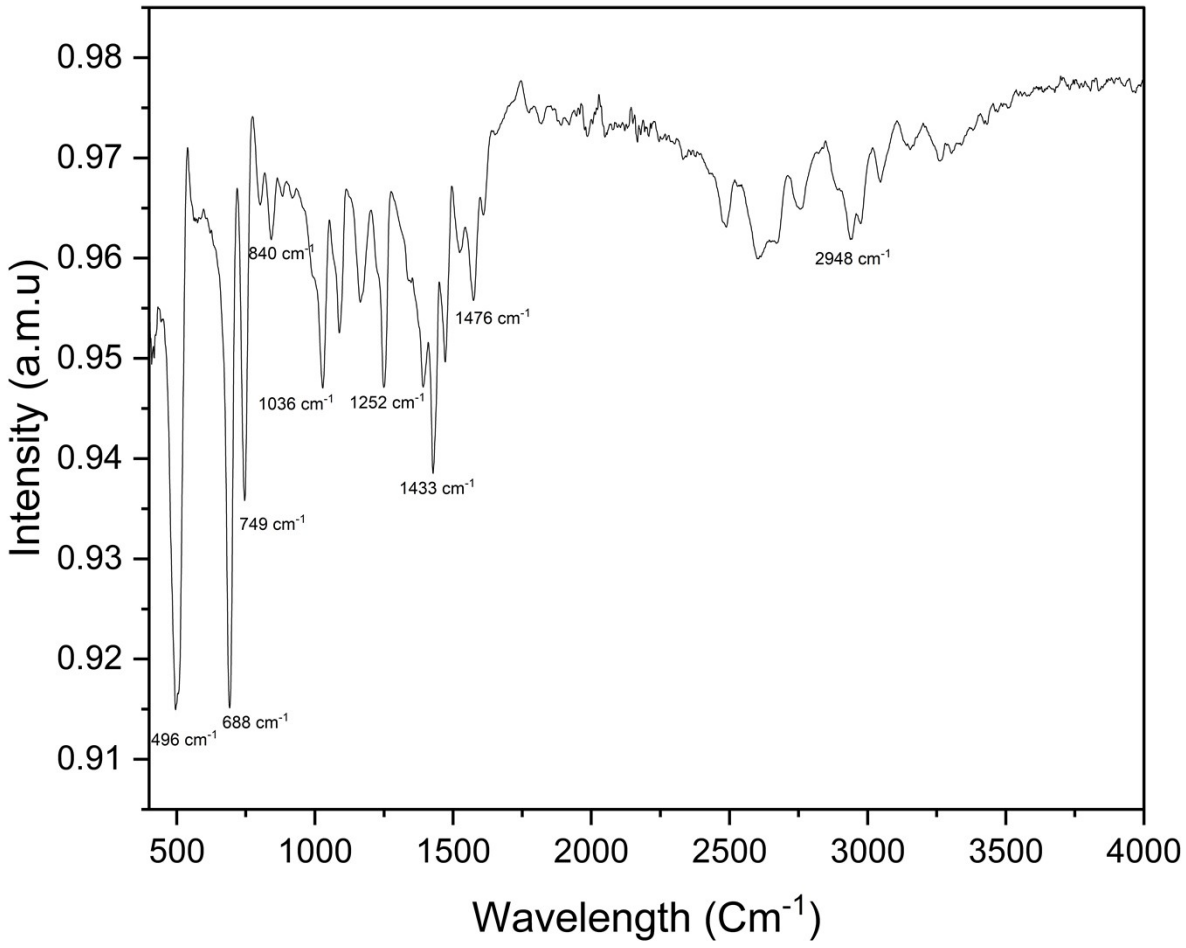


Fig. S1. IR spectra of $CuCl(dmpymSH)(PPh_3)_2$ (**1**)

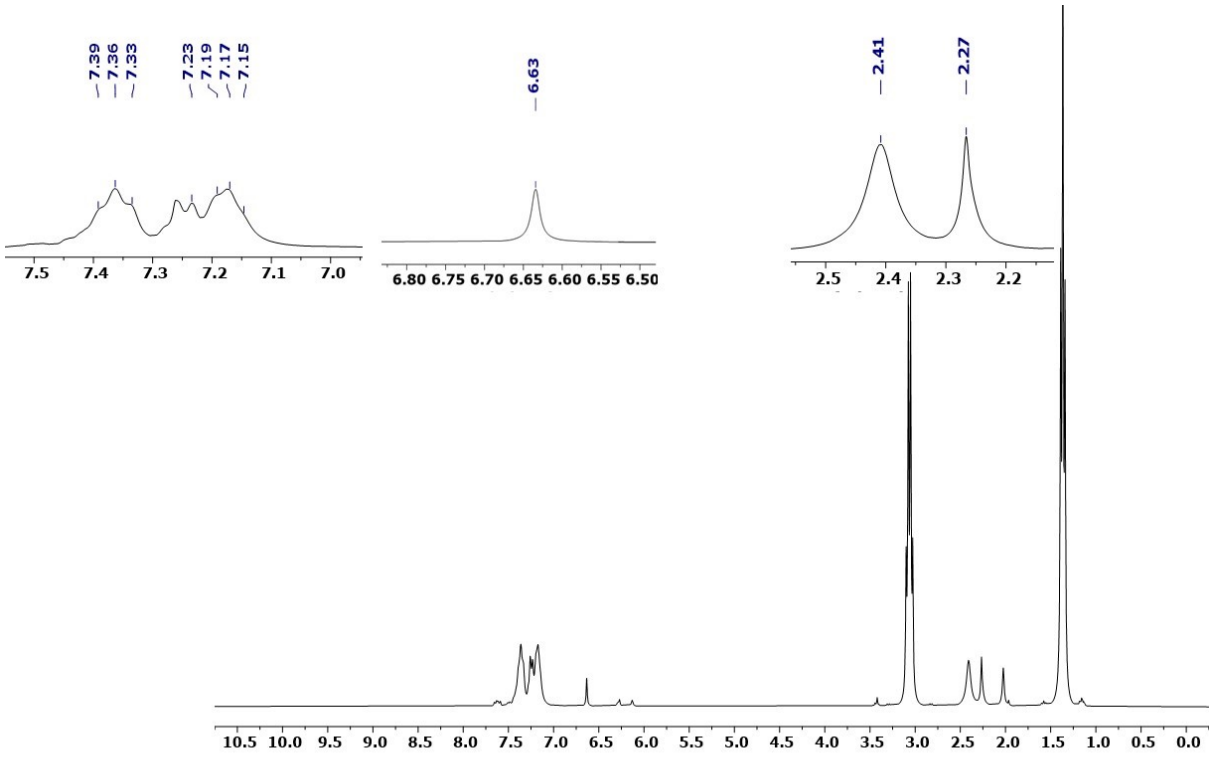


Fig. S2. ^{1}H NMR spectra of CuCl(dmpymSH)$(PPh_3)_2$ (**1**)

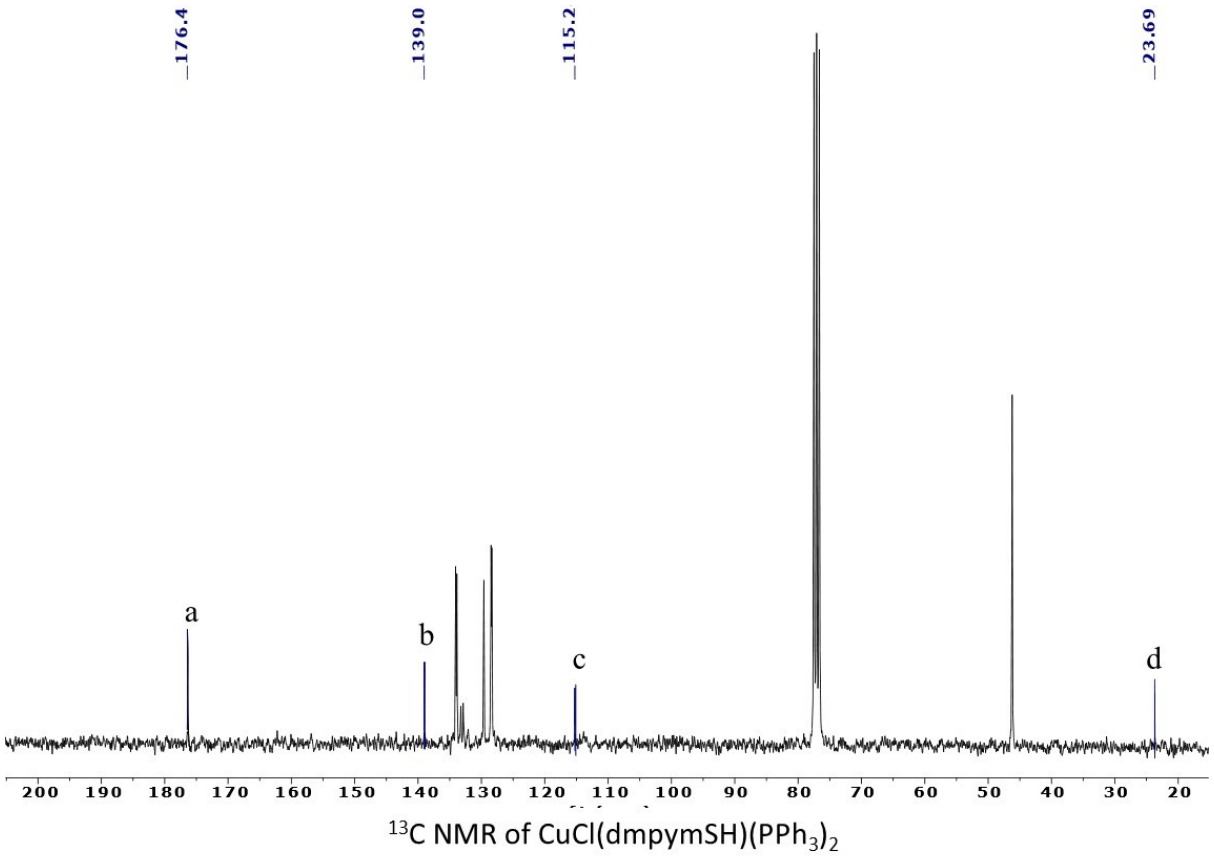


Fig. S3. $^{13}C\{^{1}H\}$ NMR spectra of CuCl(dmpymSH)$(PPh_3)_2$ (**1**)

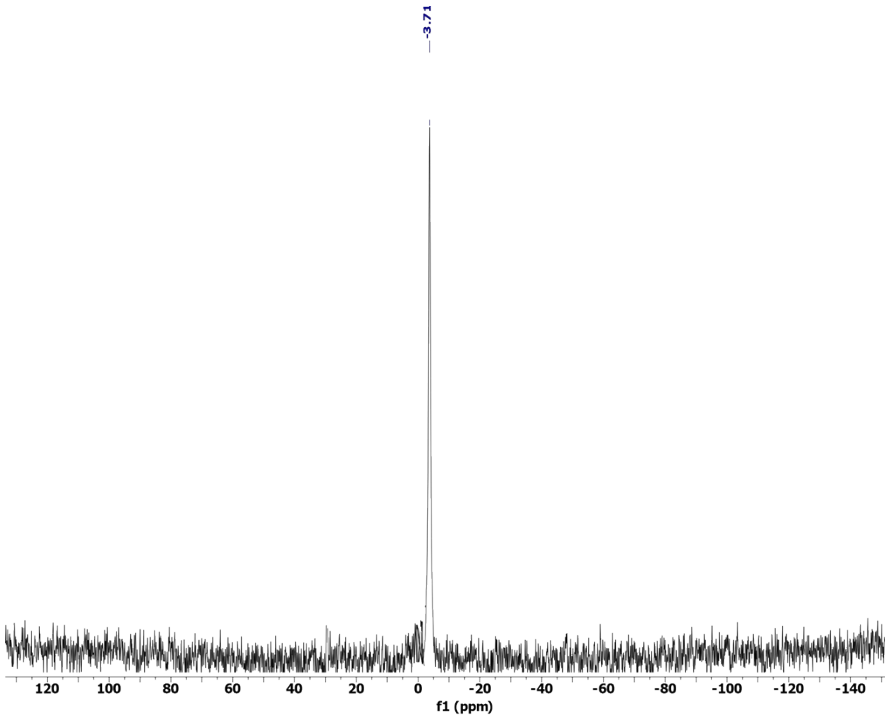


Fig. S4. $^{31}P\{^{1}H\}$ NMR spectra of CuCl(dmpymSH)$(PPh_3)_2$ (**1**)

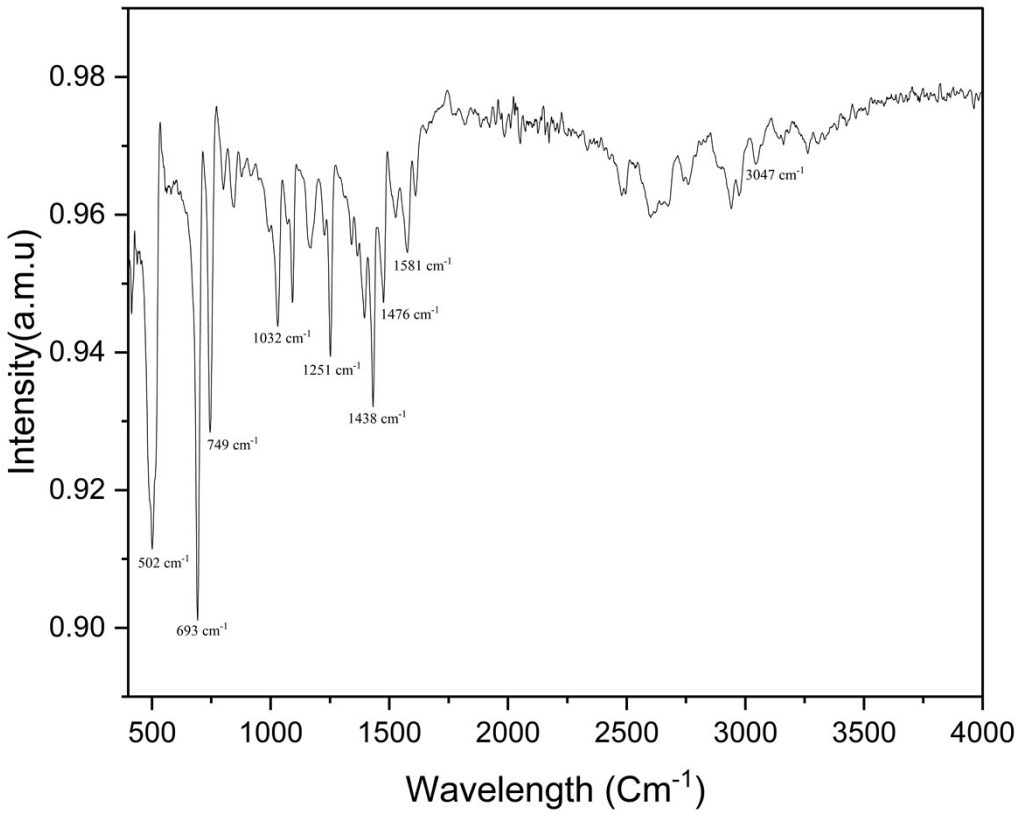
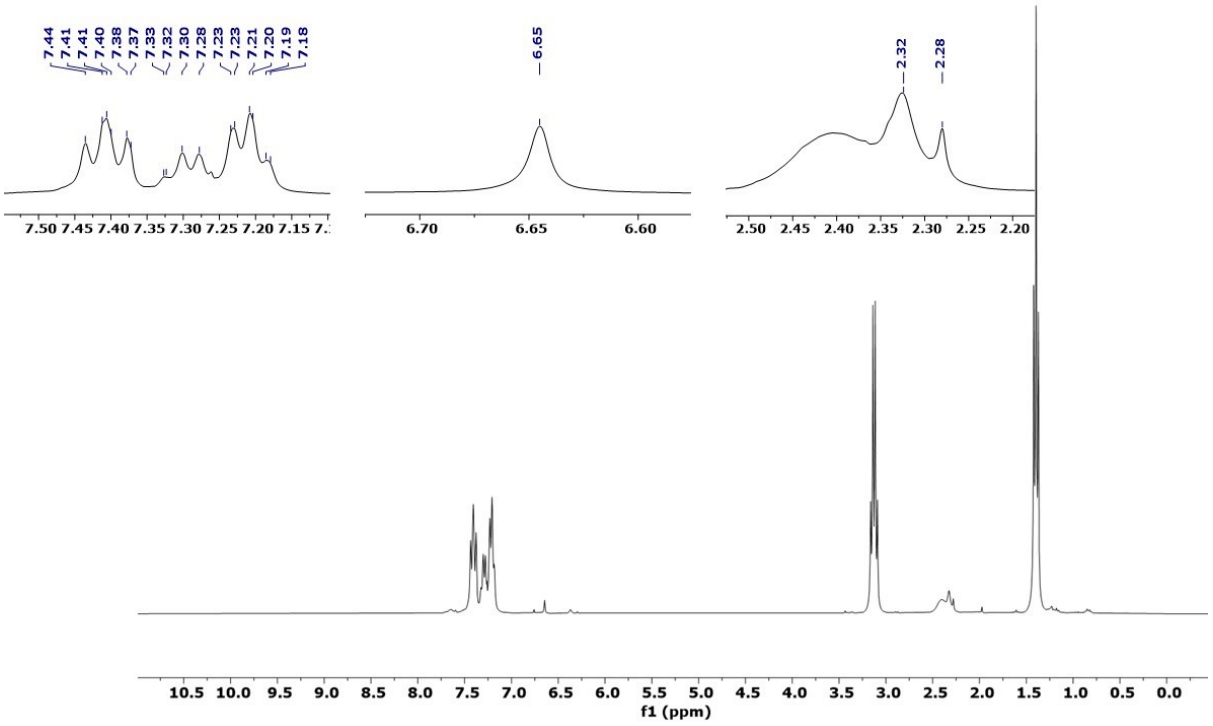


Fig. S5. IR spectra of CuI(dmpymSH)(PPh_3)$_2$ (**2**)



^{1}H NMR of [CuI(dmpymSH)(PPh_3)$_2$]

Fig. S6. ^{1}H NMR spectra of CuI(dmpymSH)(PPh_3)$_2$ (**2**)

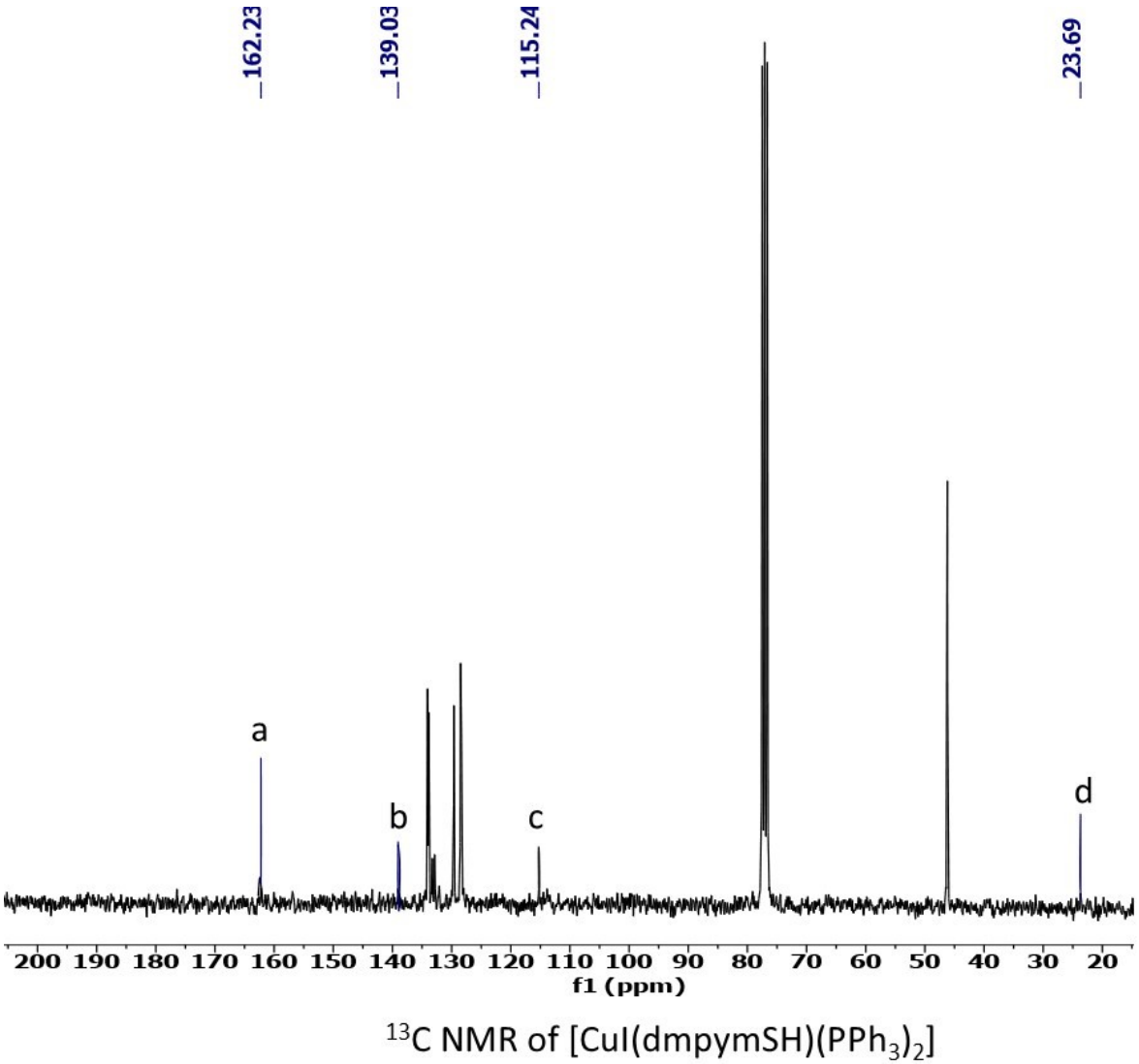


Fig. S7. ^{13}C{^{1}H} NMR spectra of CuI(dmpymSH)(PPh_3)$_2$ (**2**)

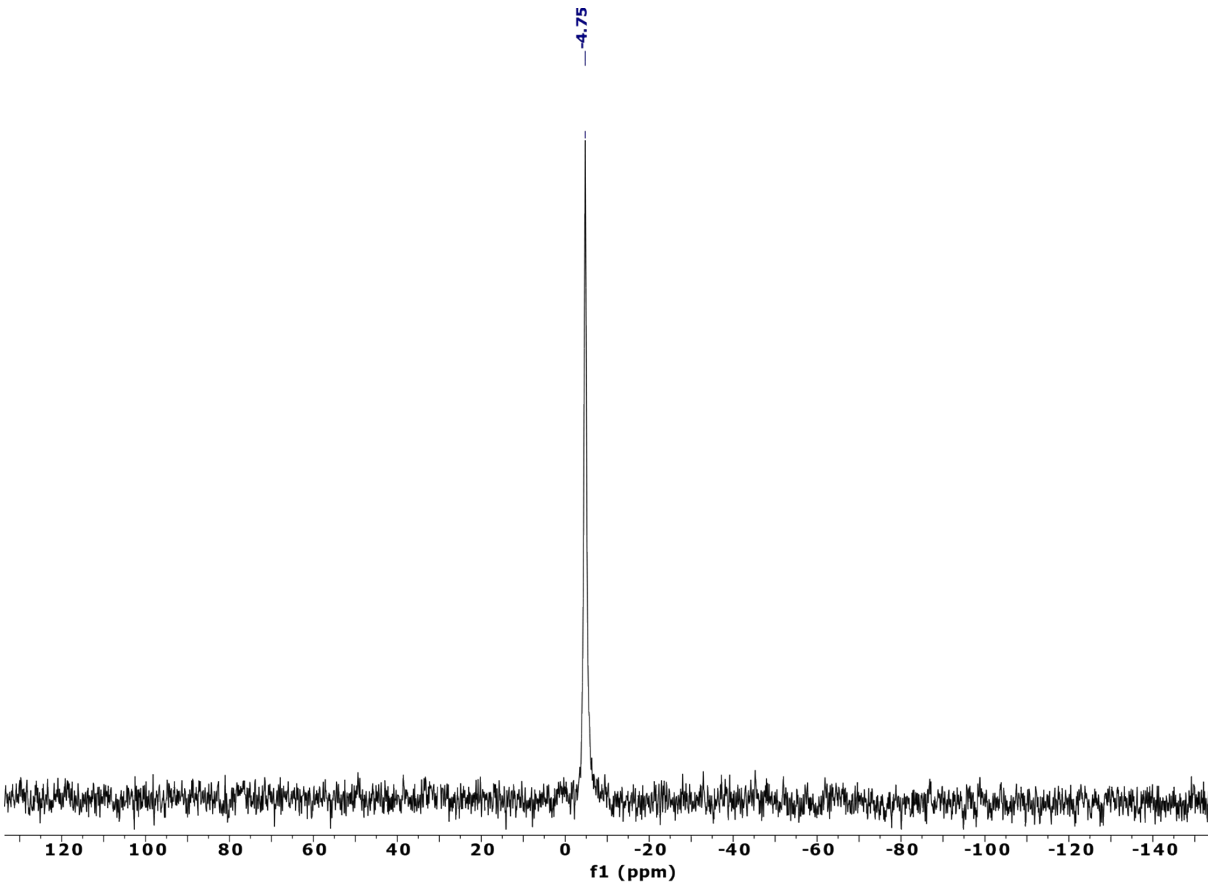


Fig. S8. $^{31}P\{^{1}H\}$ NMR spectra of CuI(dmpymSH)$(PPh_3)_2$ (**2**)

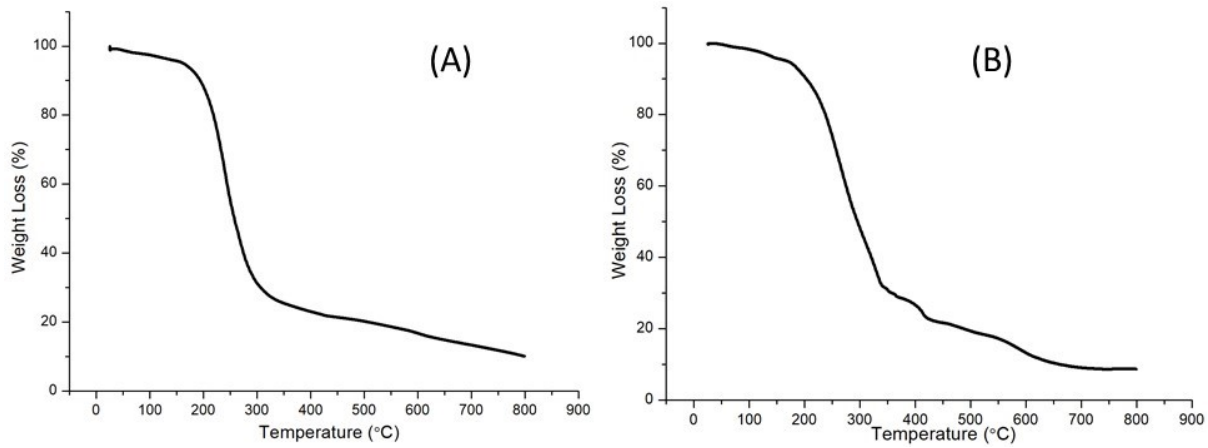


Fig. S9. TG analysis of (a) CuCl(dmpymSH)$(PPh_3)_2$ (**1**) and (b) CuI(dmpymSH)$(PPh_3)_2$ (**2**).

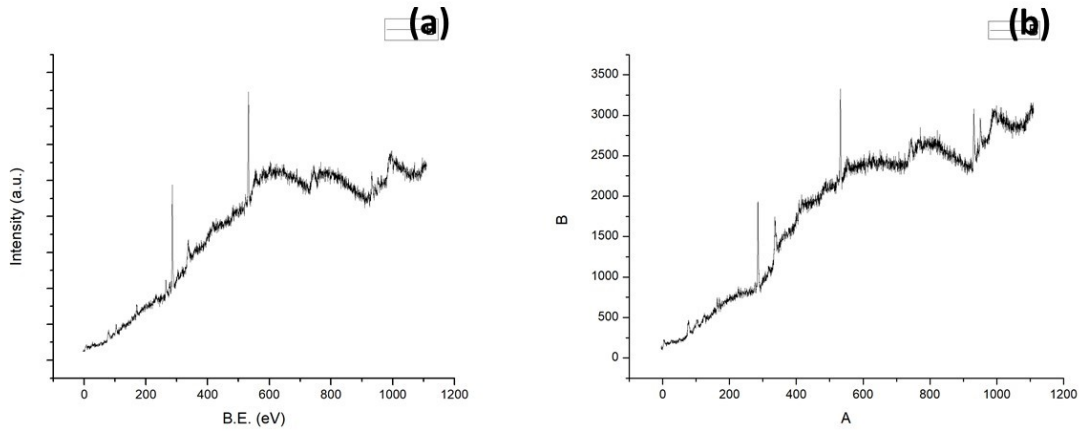


Fig. S10. XPS survey spectra respectively for (a, b) Cu_9S_5 and (c, d) $Cu_{31}S_{16}$ nanostructures.

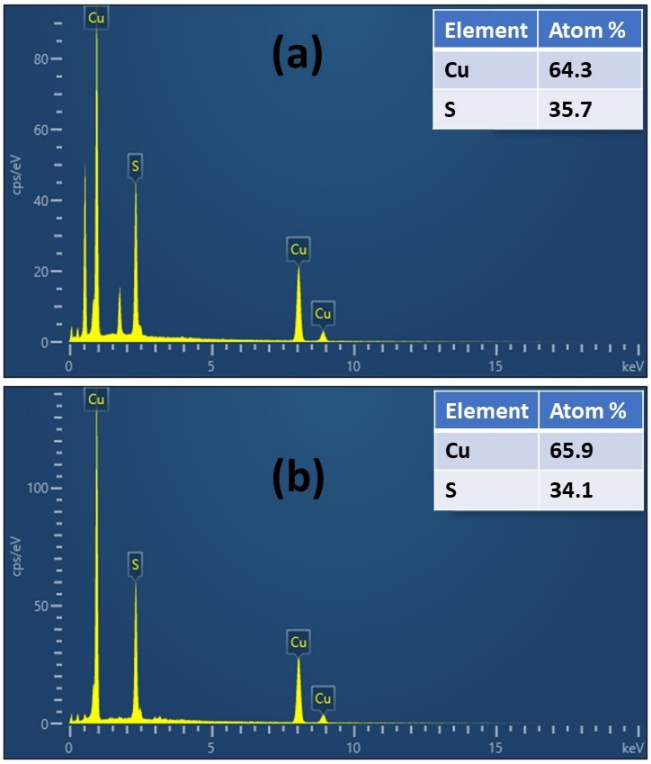


Fig. S11. EDS spectra of (a) Cu_9S_5 and (b) $Cu_{31}S_{16}$ nanoparticles respectively.

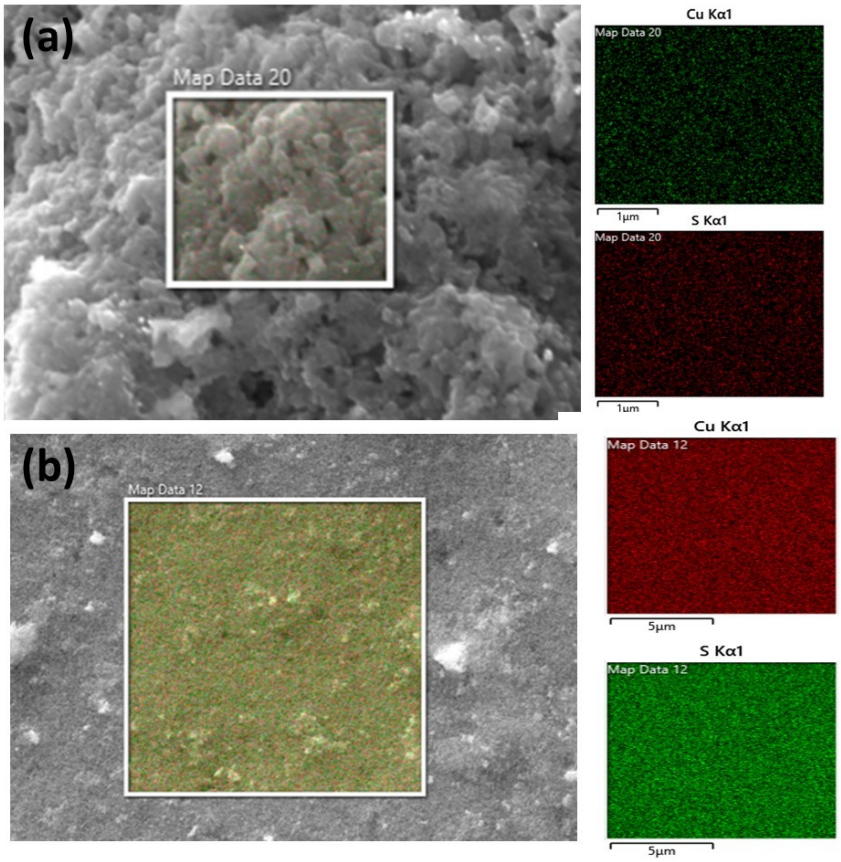


Fig. S12. 2D elemental mapping of (a) Cu_9S_5 and (b) $Cu_{31}S_{16}$ nanoparticles respectively.