**Supplementary material**

# **XPS, structural and antimicrobial studies of novel functionalized halloysite nanotubes**

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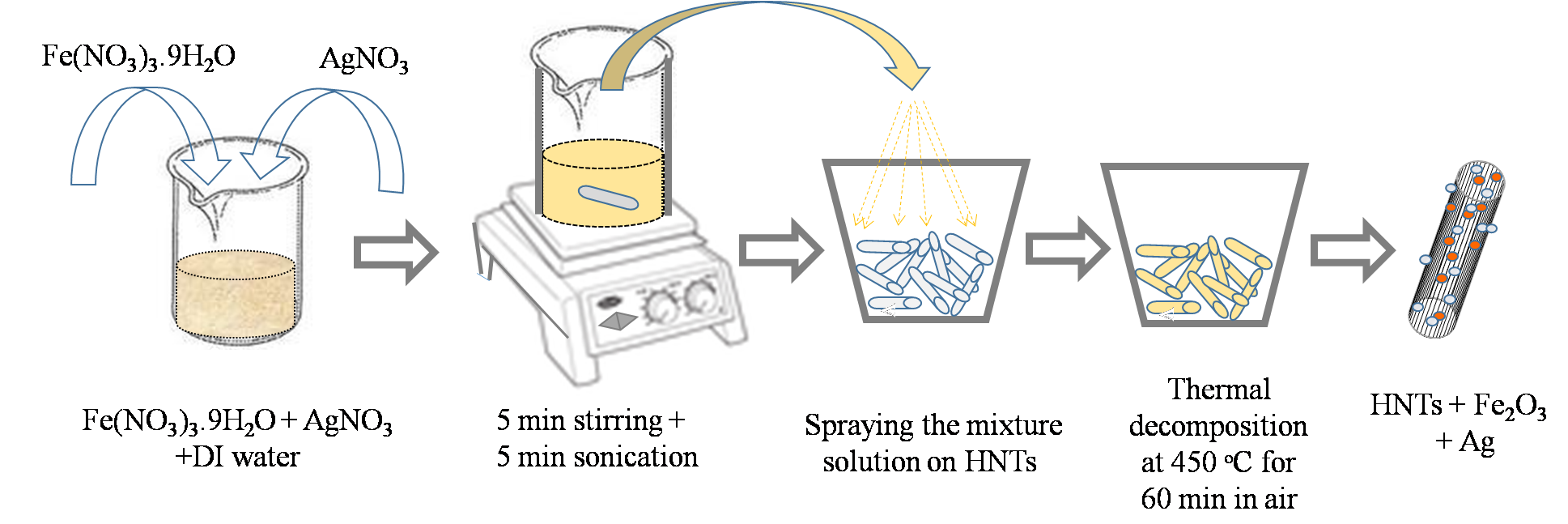


Figure S1. The schematic shows synthesis steps of HNTs-Fe2O3-Ag composites.

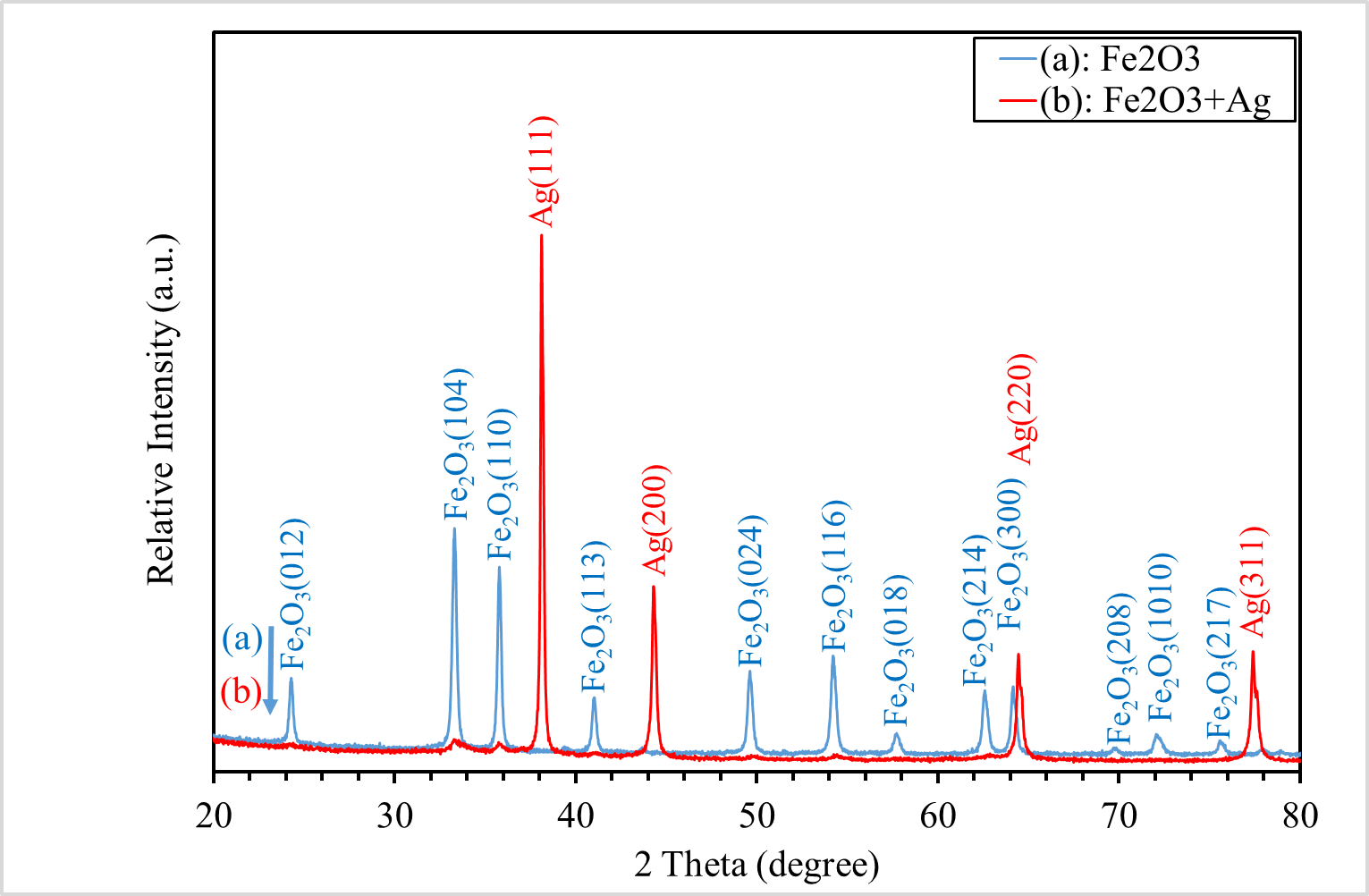
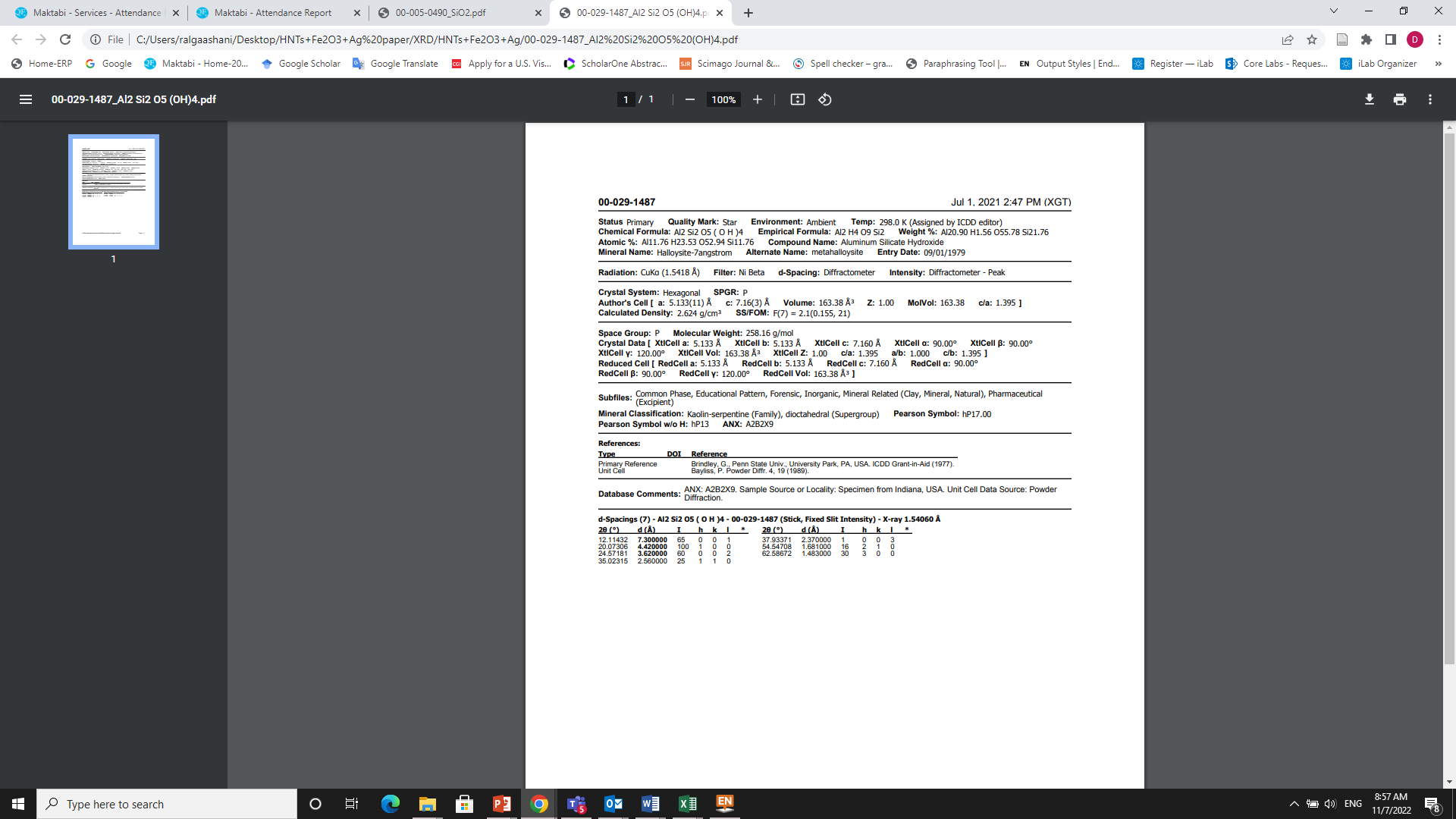


Figure S2. XRD spectra of Fe2O3 (a) and Fe2O3+Ag nanocomposites (b). It is clear that the intensity of iron oxide is much less than the silver intensity (b).





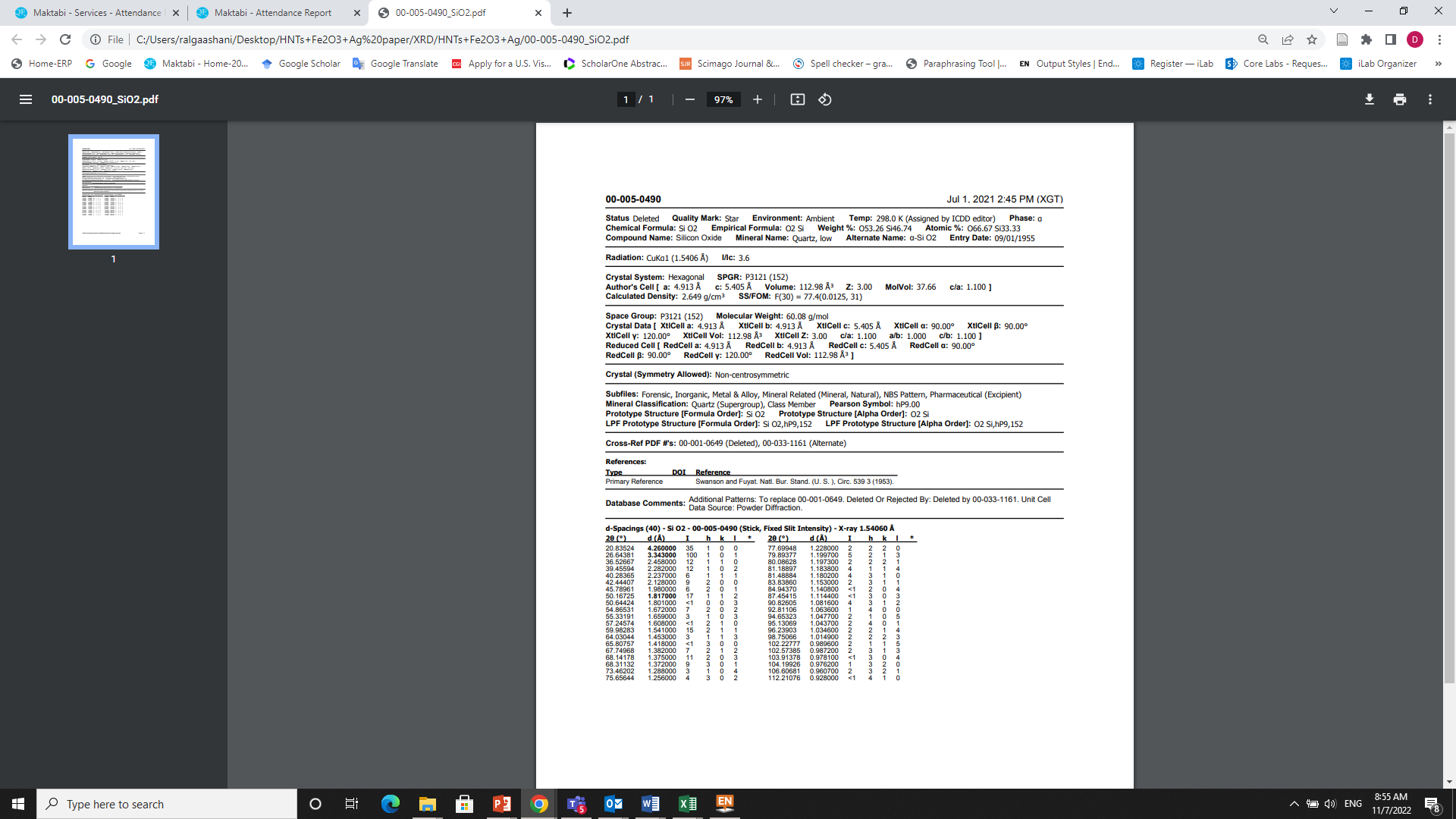
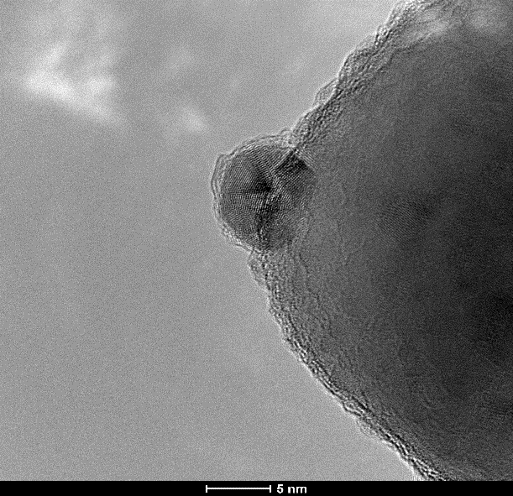
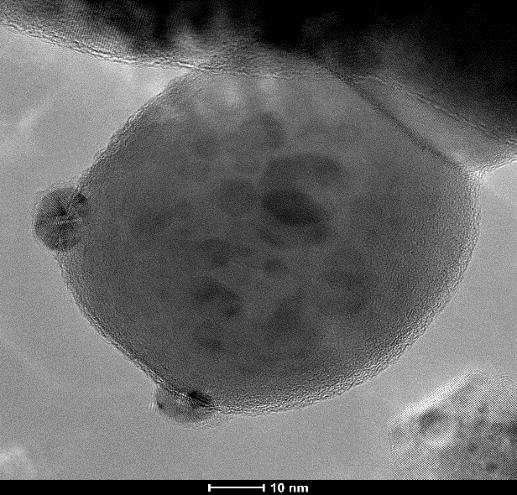
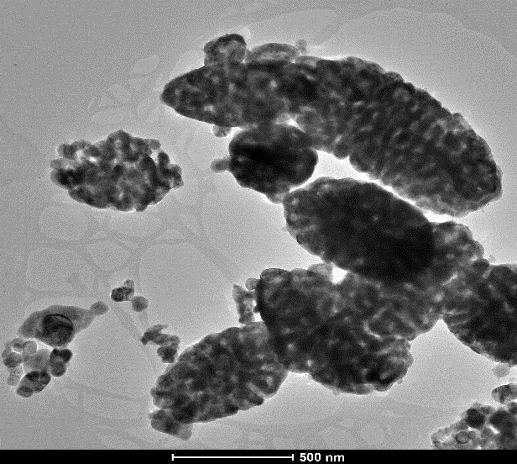
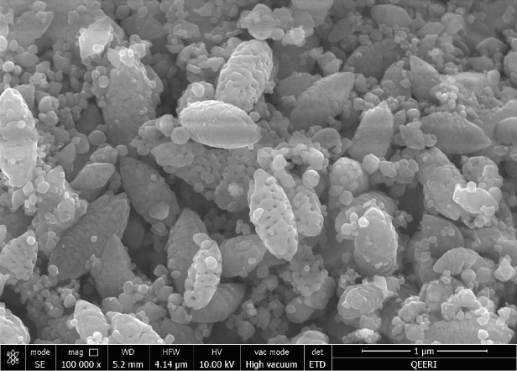
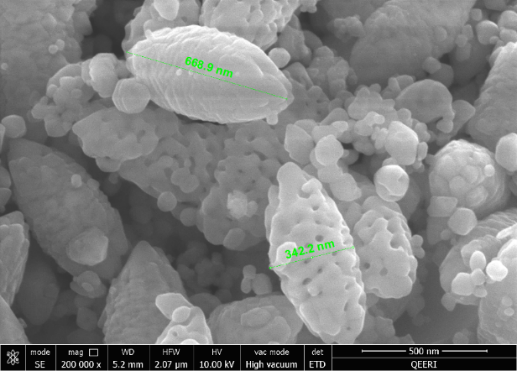
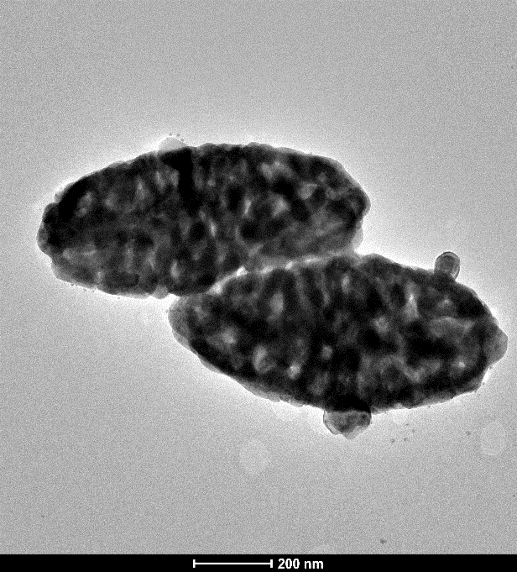


Figure S3. XRD pattern of raw HNTs showing two phases: halloysite or aluminum silicate hydroxide (PDF# 00-029-1487) and quartz (PDF# 00-005-0490).



**(a)**

**(b)**

**(c)**

**(d)**

**(f)**

**(e)**

Figure S4. SEM (a, b) and TEM (c-f) images of Fe2O3-Ag nanocomposite

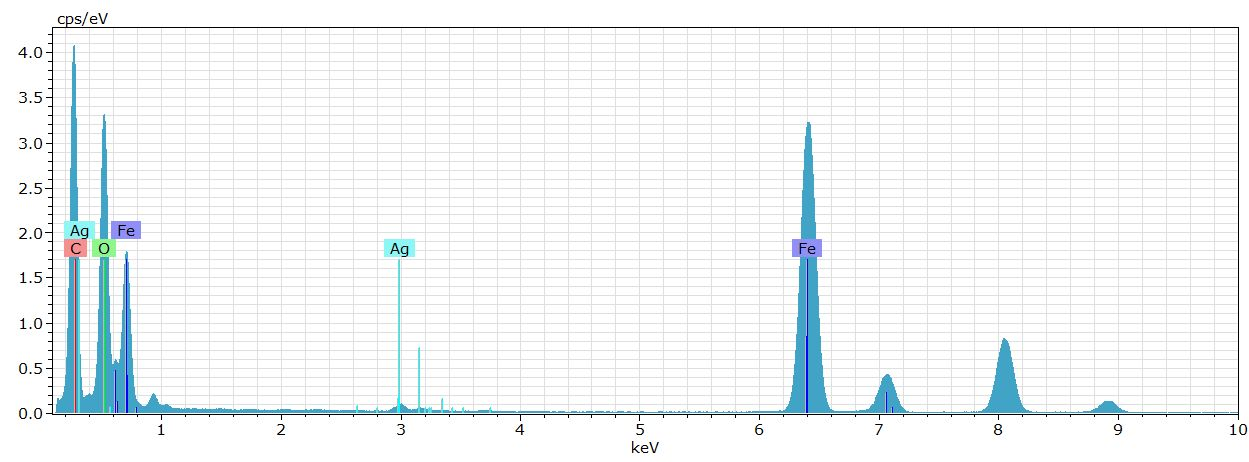
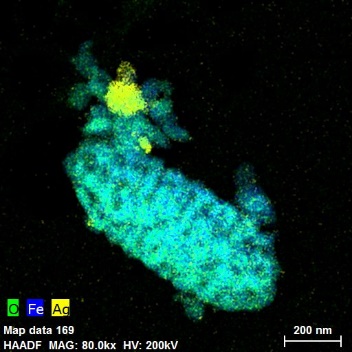
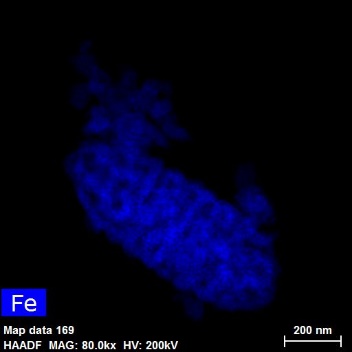
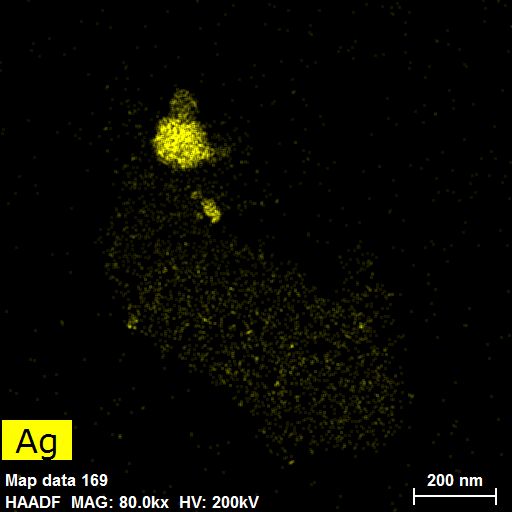
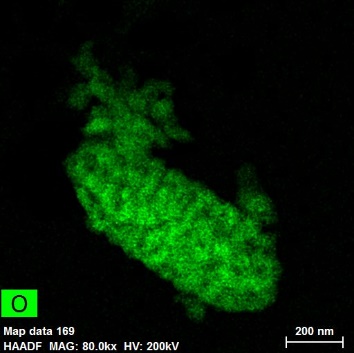
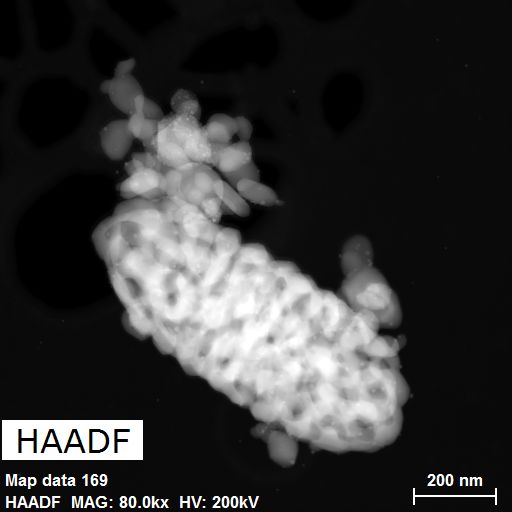
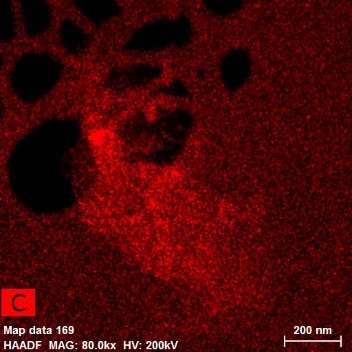


Figure S5. EDS mapping and EDS spectrum of Fe2O3-Ag nanocomposite.