Co$^{2+}$ and Ho$^{3+}$ doped CuS nanocrystals with improved photocatalytic activity under visible-light irradiation

Zahra Hosseinpour, a, b*, Sara Hosseinpour, a Malik Maaza, c, d Alice Scarpellini, b

a Department of Inorganic Chemistry, Faculty of Chemistry, University of Tabriz, 51666-14766 Tabriz, Iran.
b Nanochemistry Department, Istituto Italiano di Tecnologia, Via Morego, 30, 16163 Genoa (Italy)
c. UNISA Africa Chair in Nanosciences-Nanotechnology, College of Graduate Studies, University of South Africa, Muckleneuk ridge, PO Box 392, Pretoria, South Africa
d. NanoAfNet, Nanolaboratories, iThemba LABS-National Research Foundation of South Africa, Old Faure Road, POBox 722, Somerset West 7129, Western Cape Province, South Africa.

Figure SI 1. XRD pattern of Cu$_9$S$_5$ obtained after 5 min stirring at room temperature
Figure. SI 2: EDS spectra of as synthesized M doped CuS structures through a hydrothermal method after 1 h (a) holmiun doping, (b) cobalt doping

Figure SI 3. Absorption spectra of PC, CC, and HC samples.
Figure SI 4. Plots of $(\alpha h \nu)^2$ versus energy for PC, CC and HC samples.

Figure SI 5. PL spectra of PC, CC1 and CC samples.
Figure SI 6. PL spectra of PC, HC samples.