

## Electronic supplementary information (ESI):

### Highly luminescent monolayer protected $\text{Ag}_{56}\text{Se}_{13}\text{S}_{15}$ clusters

C. K. Manju,<sup>a</sup>IndranathChakraborty<sup>a,b</sup> and ThalappilPradeep<sup>a\*</sup>

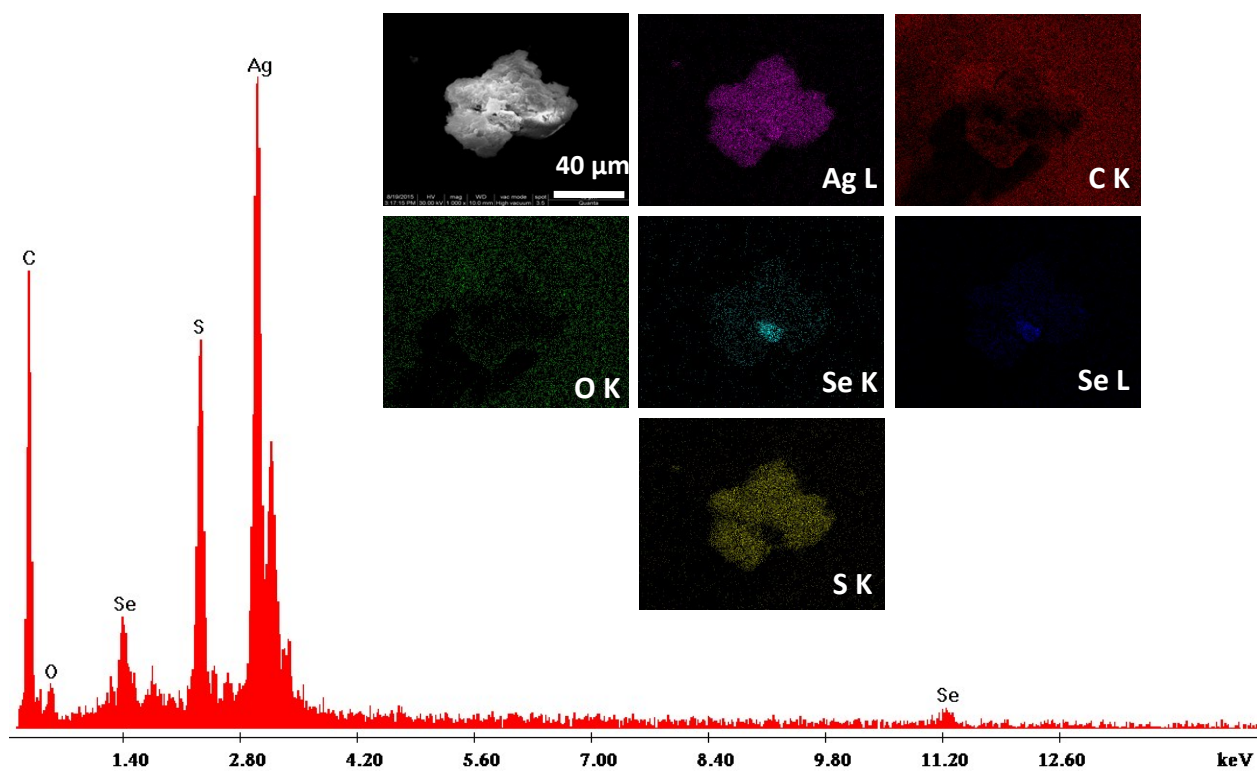
<sup>a</sup>*DST Unit of Nanoscience (DST UNS) and Thematic Unit of Excellence,  
Department of Chemistry, Indian Institute of Technology Madras,  
Chennai 600036, India.*

<sup>b</sup>Current affiliation: *University of Illinois at Urbana Champaign, Urbana, IL  
61801, USA.*

## Table of contents

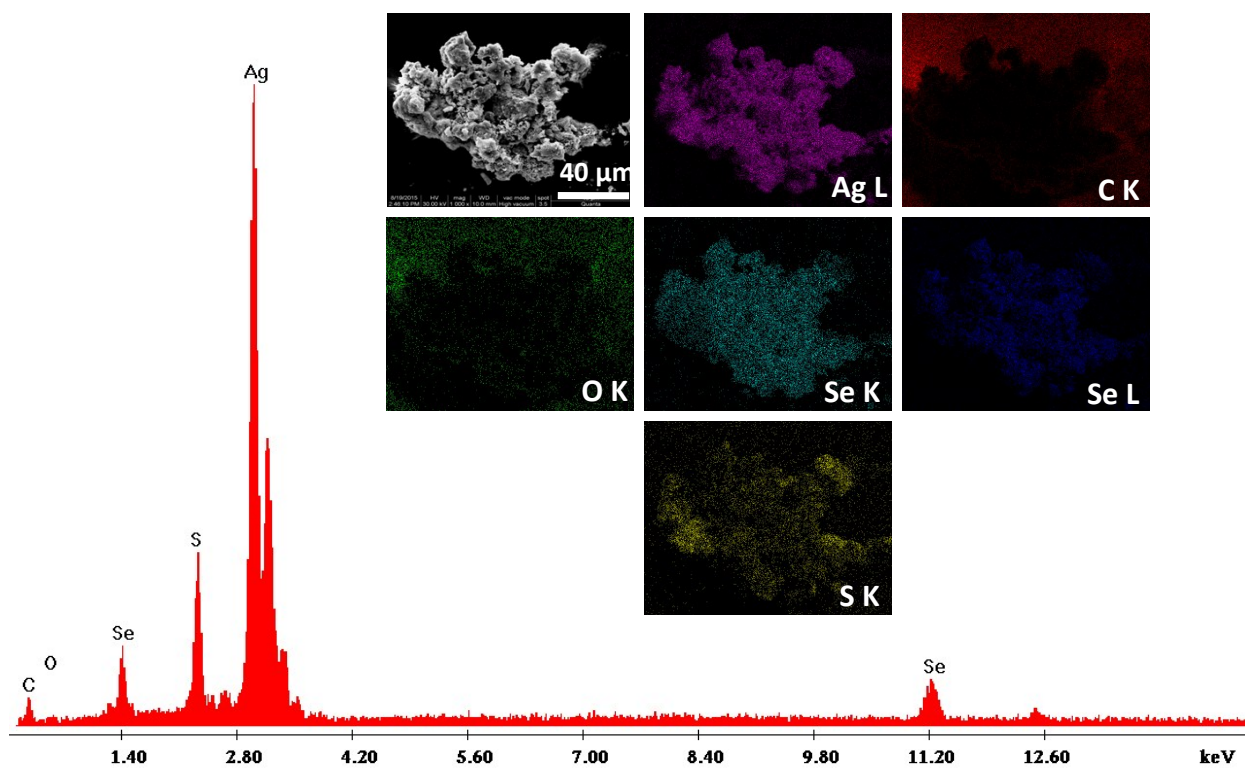
No	Description	Pg No
S1	SEM EDX and elemental mapping of pure cluster	2
S2	SEM EDX and elemental mapping of annealed cluster	3
S3	PI spectrum showing the effect of different metal ions and concentration dependent $\text{Hg}^{2+}$ quenching	4
S4	XPS spectrum of cluster after $\text{Hg}^{2+}$ addition	5
S5	Real water luminescence quenching experiment	6

## Supporting information 1



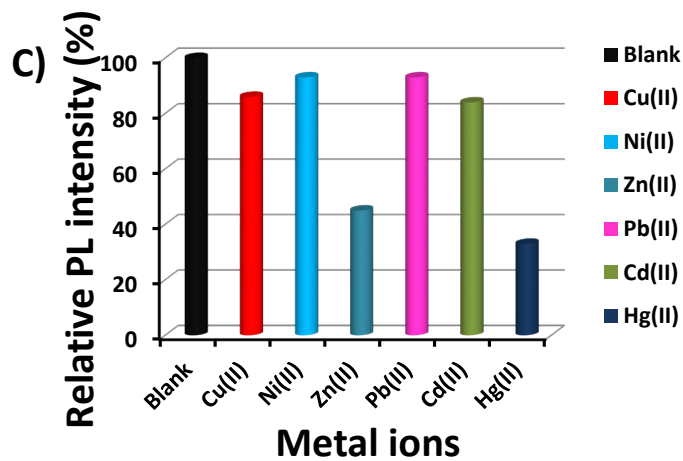
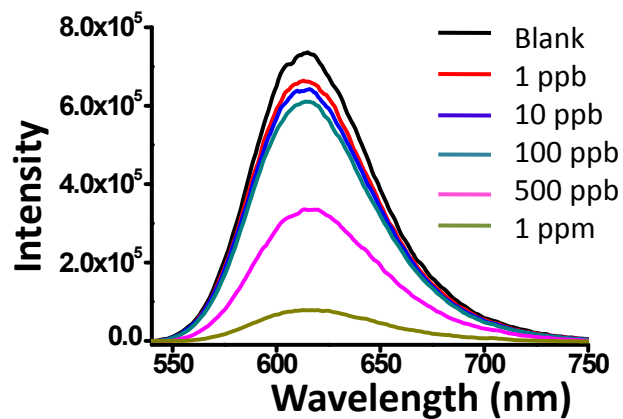
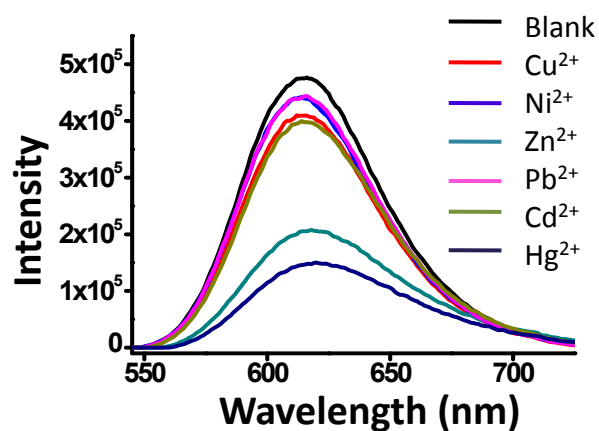
**Fig. S1** SEM EDAX spectrum and elemental mapping of purified cluster. The Ag:Se:S ratio is 1:0.24:0.70.

## Supporting information 2



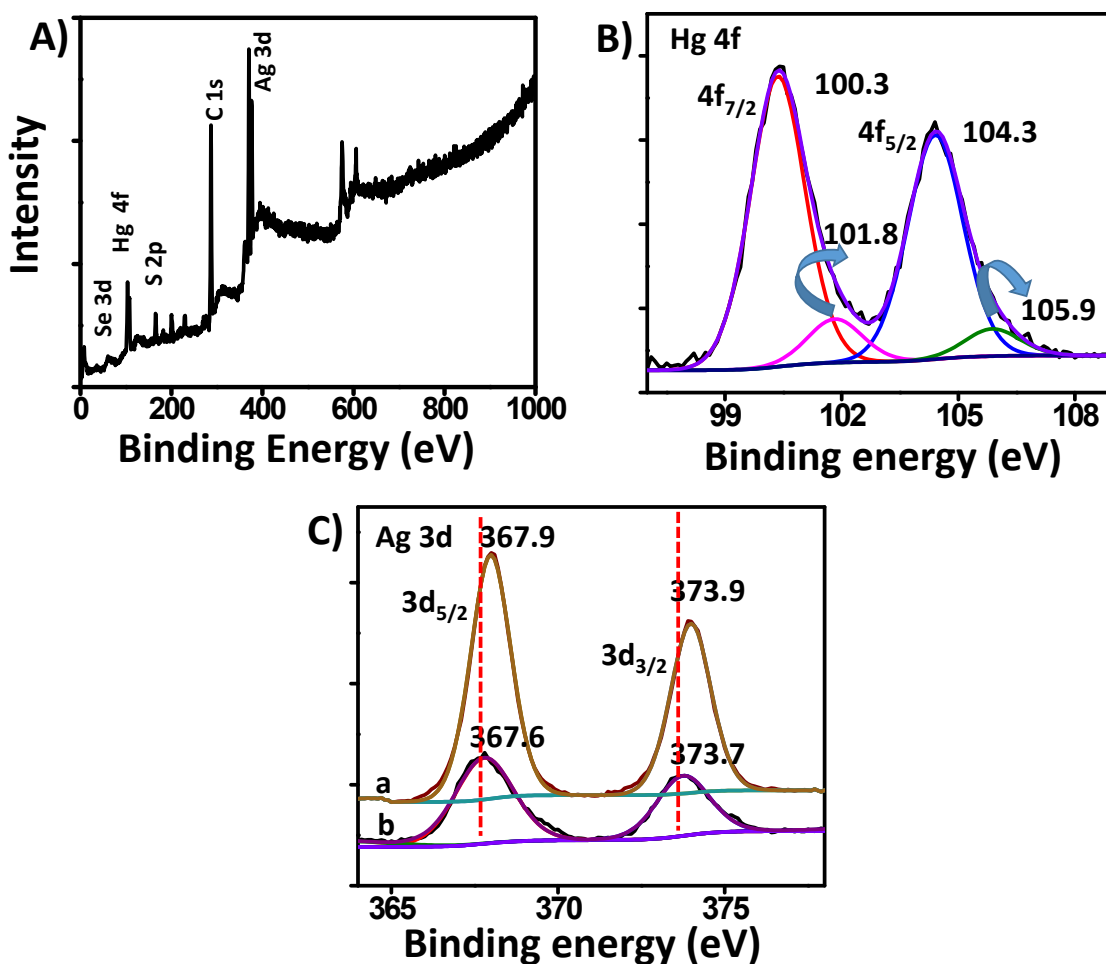
**Fig. S2** SEM EDAX spectrum and elemental mapping of annealed cluster. The Ag:Se:S ratio is 1:0.24:0.30.

### Supporting information 3



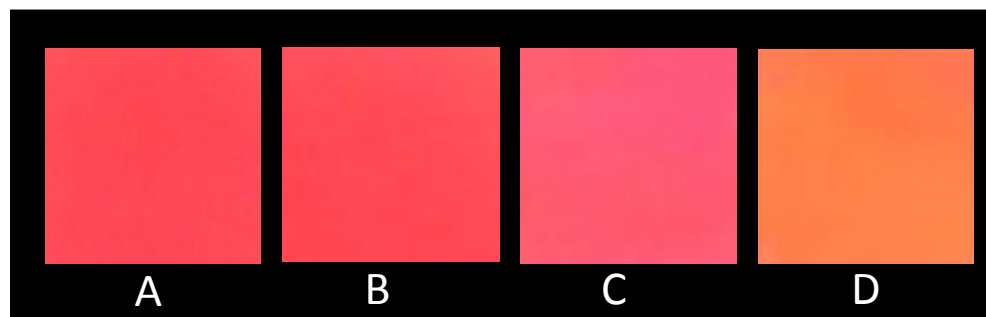
**Fig. S3** Effect of different metal ions on the emission intensity of the cluster (A). Hg(II) concentration effect on cluster emission (B). (C) Bar diagram of different metal ion sensitivity. Hg(II) shows maximum quenching.

## Supporting information 4



**Fig. S4** XPS survey spectrum of cluster after the addition of  $\text{Hg}^{2+}$  (A). Specific region for Hg is expanded in (B), where most of the  $\text{Hg}^{2+}$  ions are reduced to elemental mercury. Figure (C) shows the XPS spectra of silver before (a) and after (b) mercury quenching.

## Supporting information 5



**Fig. S5** (A) Cluster coated TLC plate under UV light. (B) Same TLC plate after the addition of well water. (C) After the addition of 1 ppb  $\text{Hg}^{2+}$  ion contacting well water. (D) Photograph of the quenching experiment performed on FITC pre coated TLC plate.