

**Two Magnetic orderings and a spin-flop transition in mixed valence compound  
 $\text{Mn}_3\text{O}(\text{SeO}_3)_3$**

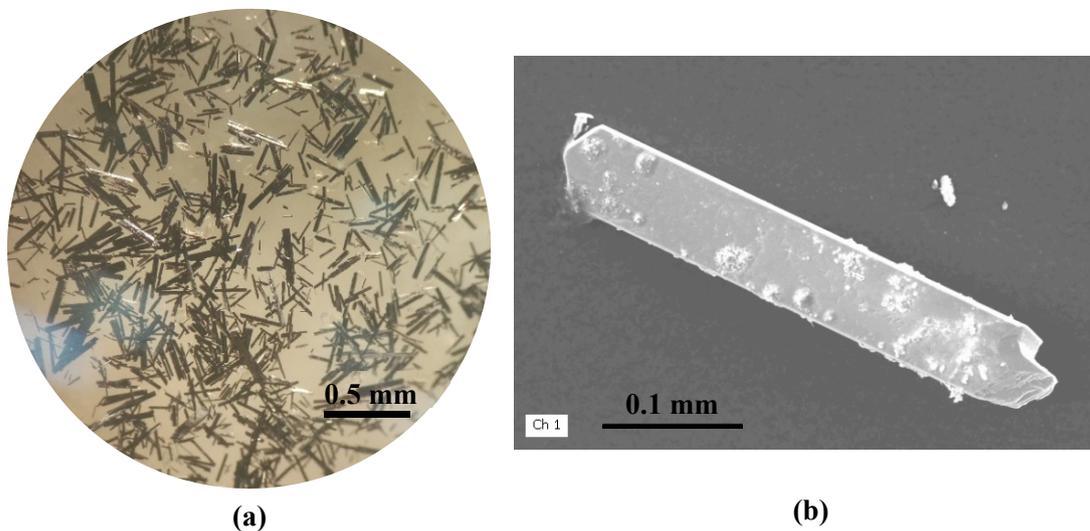
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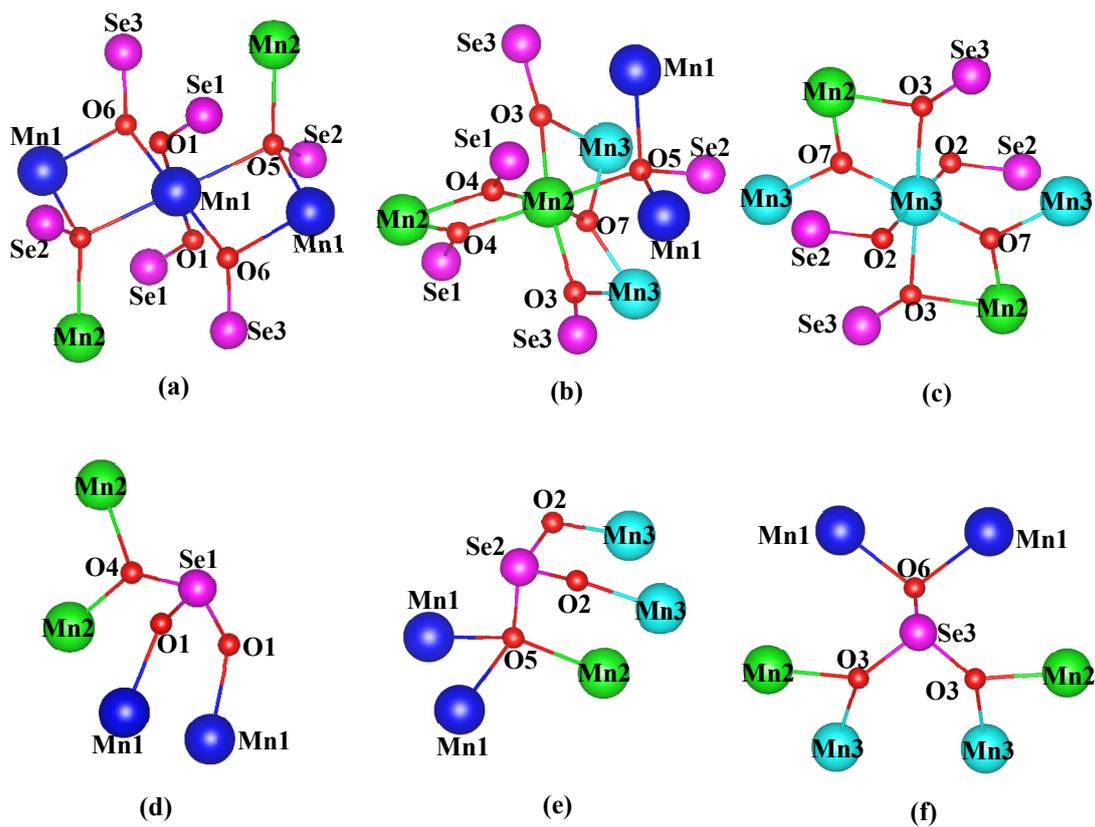
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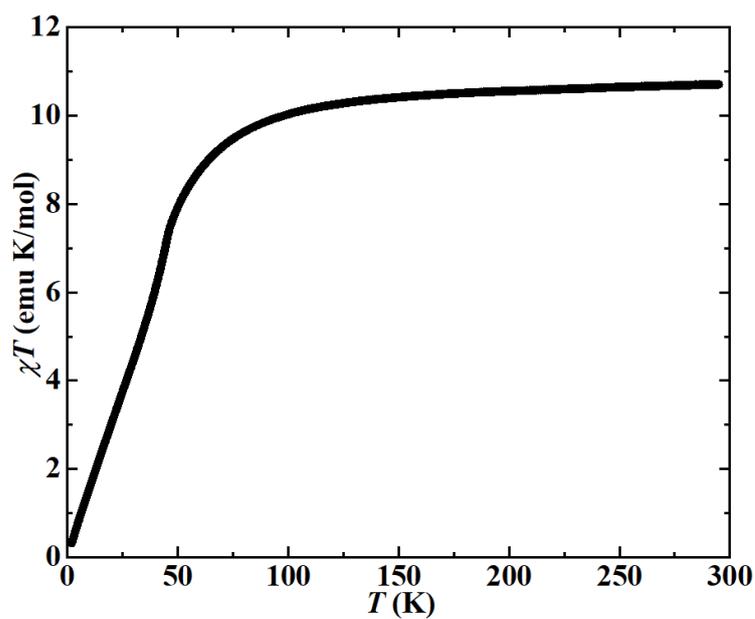
E-mail: qiangy@mail.sysu.edu.cn



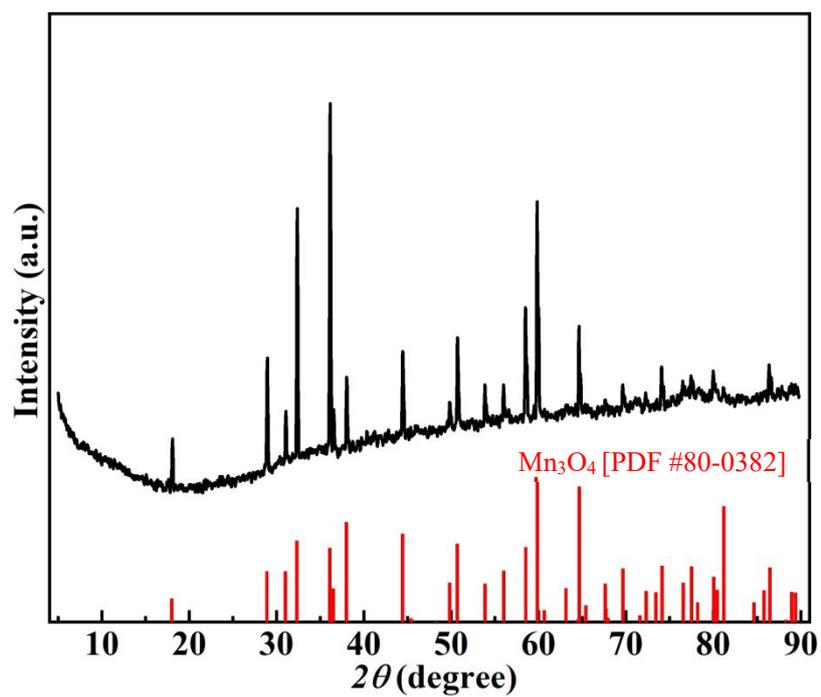
**Figure S1.** Single crystals of  $\text{Mn}_3\text{O}(\text{SeO}_3)_3$  obtained by a conventional hydrothermal method. (a) and (b) are the photos under optical microscope and scanning electron microscopy, respectively.



**Figure S2.** The oxygen-coordination environments for (a) Mn1, (b) Mn2, (c) Mn3, (d) Se1, (e) Se2 and (f) Se3 atoms in  $\text{Mn}_3\text{O}(\text{SeO}_3)_3$ .



**Figure S3.** The variation of  $\chi T$  with the temperature of  $\text{Mn}_3\text{O}(\text{SeO}_3)_3$ . With the decreasing temperature, the value of  $\chi T$  decreases.



**Figure S4.** Powder X-ray diffraction pattern for the final residues of  $\text{Mn}_3\text{O}(\text{SeO}_3)_3$  after sintered at 800 °C for 10 minutes in nitrogen atmosphere.