Solution synthesis of conveyor-like MnSe nanostructured architectures with an unusual core/shell magnetic structure

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**Fig. S1** The typical XPS analysis of the as-prepared WZ-MnSe nanoconveyors, (a) Mn 2p region, and (b) Se 3d region. The two distinct peaks of 642.2 and 653.9 eV are assigned to Mn $2p_{3/2}$ and Mn $2p_{1/2}$ core level, respectively, which can be used as a fingerprint to identify the presence of Mn(II), and the fitting peaks centered at 55.3 eV is consistent with Se 3d core level.$^1$

**Fig. S2** HRTEM image of the endpoint in a NW. The two yellow arrowheads indicate the boundary between Ag$_2$Se and MnSe. The Ag$_2$Se nanoparticles can be indexed to the cubic phase with the space group of $Im3m$ ($a = 4.99$ Å), and the MnSe NW has a WZ-type structure with the space group of $P6_3mc$ ($a = 4.16$ Å, $c = 6.70$ Å). Along the interfaces, the mismatch value between MnSe ($1 \bar{1} 0 0$)[11 20] and Ag$_2$Se (002)[110] is $\sim 1.7$ %, the mismatch of MnSe ($1 \bar{1} 0 0$)[0001] and Ag$_2$Se (002)[110] is $\sim 5.5$ %, and the mismatch for MnSe (0002)[3 3 00] and Ag$_2$Se (002)[110] is $\sim 16$ %, as calculated using the standard cell parameters.
**Fig. S3** TEM images of the sample obtained at different amount of Ag nanoparticle solution: (a) 0.05 mL, and (b) 0.2 mL.

**Fig. S4** (a, b) low-, (c) high-magnification TEM images of the synthesized MnSe nanosaws with thick teeth.
**Fig. S5** SEM images of the synthesized MnSe nanopods.

**Fig. S6** (a) low-, (b) high-magnification TEM images, (c) HRTEM image of the synthesized MnSe nanocondyles.
Fig. S7 (a) Temperature dependence of FC and ZFC susceptibility, (b) hysteresis loops at 5 K for the short teeth nanoconveyors obtained at 300 °C, 3 min and solid nanopods.