Facile synthesis and enhancement upconversion luminescence of ErF$_3$ nano/microstructures via Li$^+$ doping

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The composition and phase purity of the precursors were first examined by XRD. XRD patterns of precursors prepared with PVP, CTAB, Cit$^-$ and EDTA$_2$Na as chelating agent, respectively, are shown in Fig. s1. It could be seen that when PVP, CTAB or Cit$^-$ was chosen as additive, respectively, the formation phase is the standard cubic phase of (NH$_4$)$_2$Er$_5$F$_{17}$ crystal structure, while EDTA$_2$Na was chosen as chelating agent, the product changed to be orthorhombic phase of ErF$_3$.

Fig. s1 XRD patterns of precursors prepared with different additives