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Lattice Restraint Induced Ultra-large Bandgap Widening of ZnO Nanoparticles

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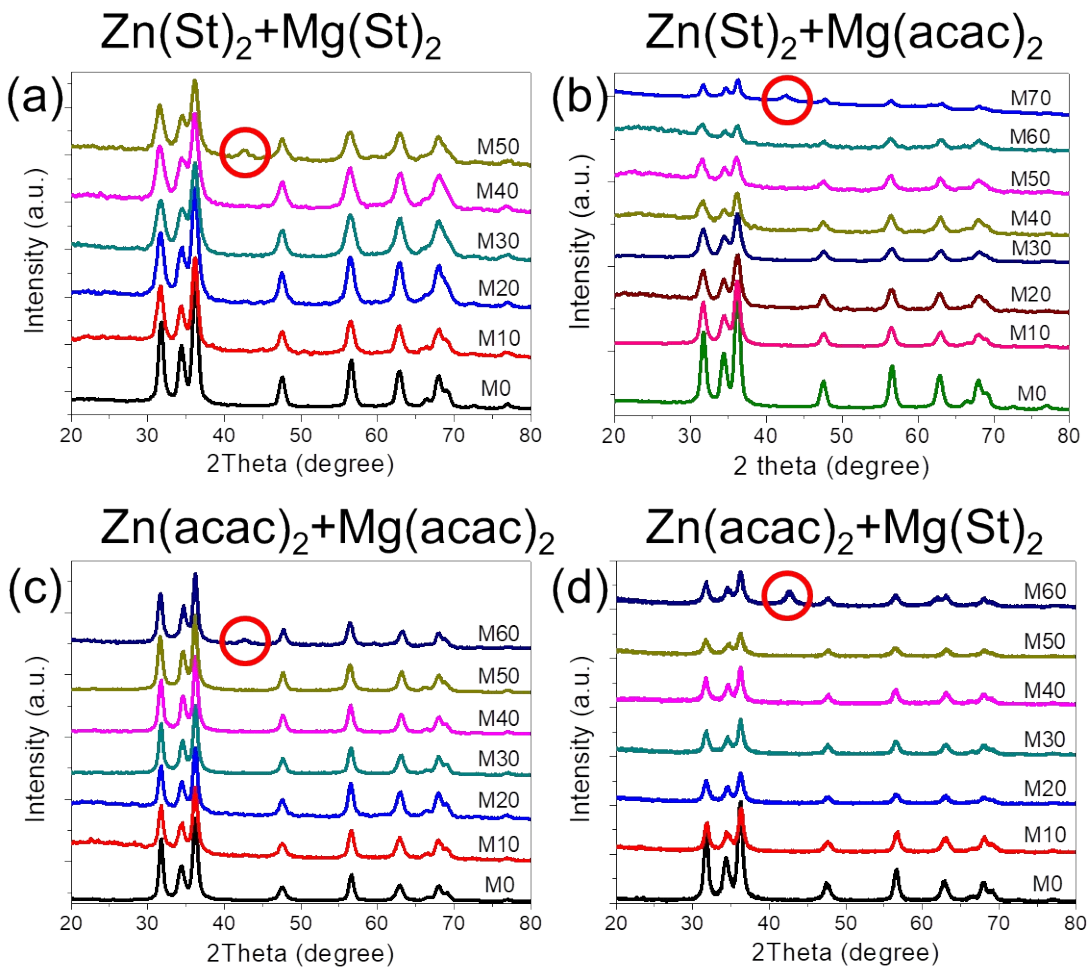

Fig. S1. XRD patterns of ZnMgO nanoparticle alloys prepared with different precursors and nominal Mg concentrations. (a) $Zn(St)_2$+$Mg(St)_2$, (b) $Zn(St)_2$+$Mg(acac)_2$, (c) $Zn(acac)_2$+$Mg(acac)_2$, (d) $Zn(acac)_2$+ $Mg(St)_2$.

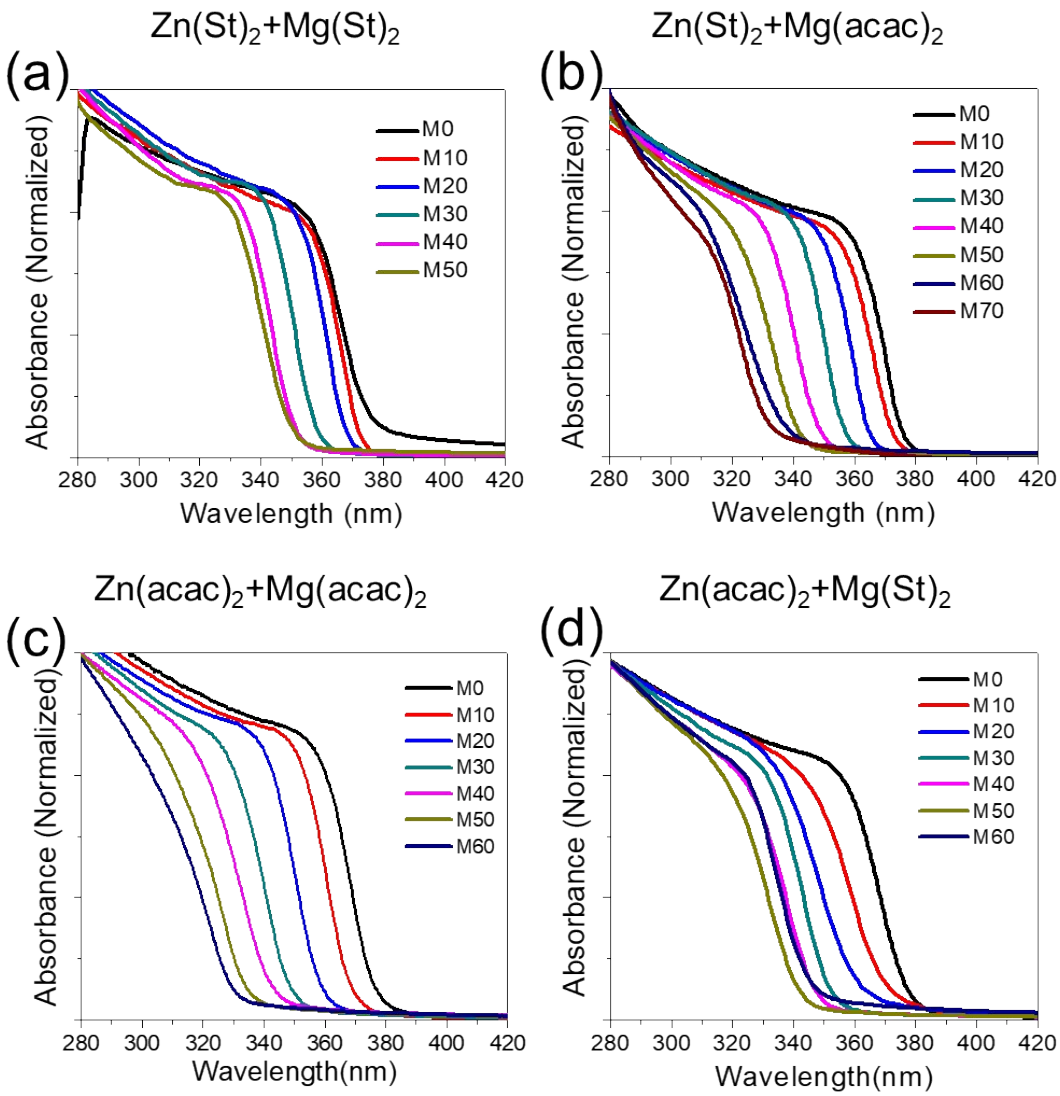

Fig. S2. Absorption spectra of ZnMgO nanoparticle alloys prepared with different precursors and nominal Mg concentrations. (a) $Zn(St)_2$+$Mg(St)_2$, (b) $Zn(St)_2$+$Mg(acac)_2$, (c) $Zn(acac)_2$+$Mg(acac)_2$, (d) $Zn(acac)_2$+ $Mg(St)_2$.

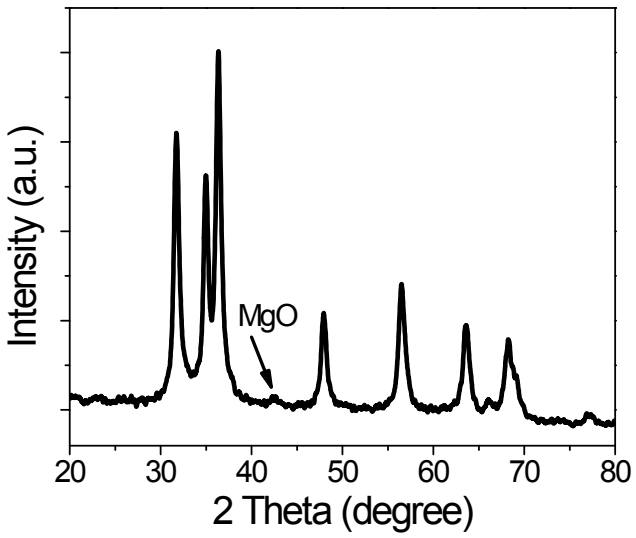

Fig. S3. XRD pattern of Be-0.2Mg-MB70 sample.

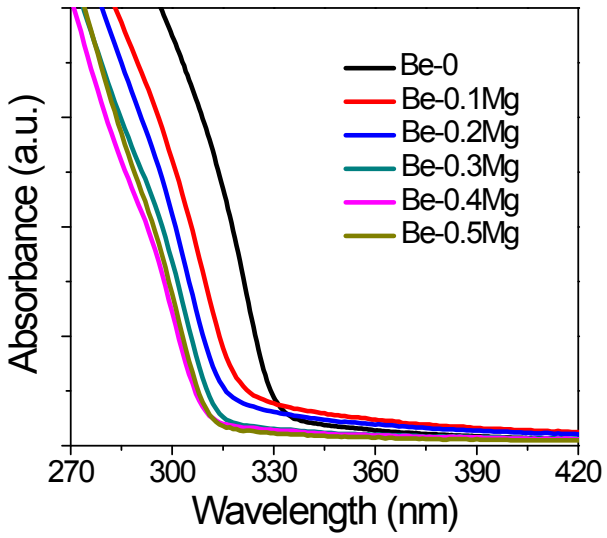

Fig. S4. Normalized absorption curves of samples with different Be concentration at a 60% nominal Mg concentration.

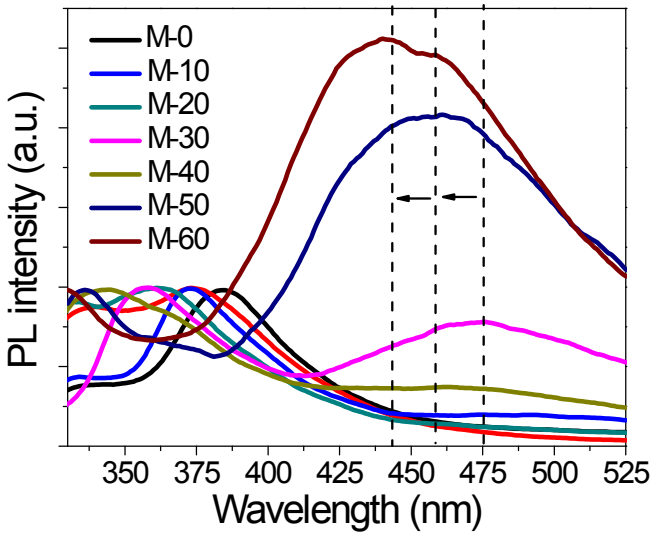

Fig. S5. PL spectra of samples with different Mg nominal concentrations.

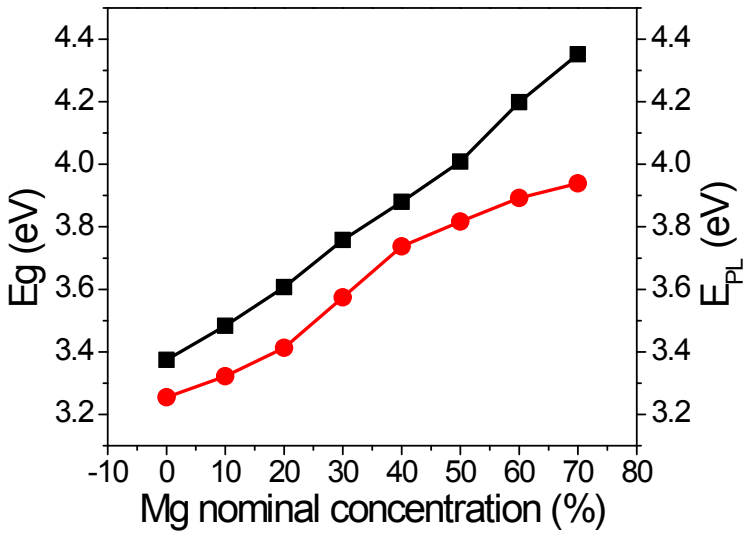

Fig. S6. Calculated Eg values and emission peak energies as a function of Mg nominal concentration. The Be to Mg ratio is 0.4.