

Exciton Delocalization in $\text{H}_2\text{OBPc}_{1-x}\text{MOBPc}_x$ ($\text{M} = \text{Co}, \text{Cu}, \text{Ni}, \text{Mn}$) Crystalline Thin Film Organic Alloys

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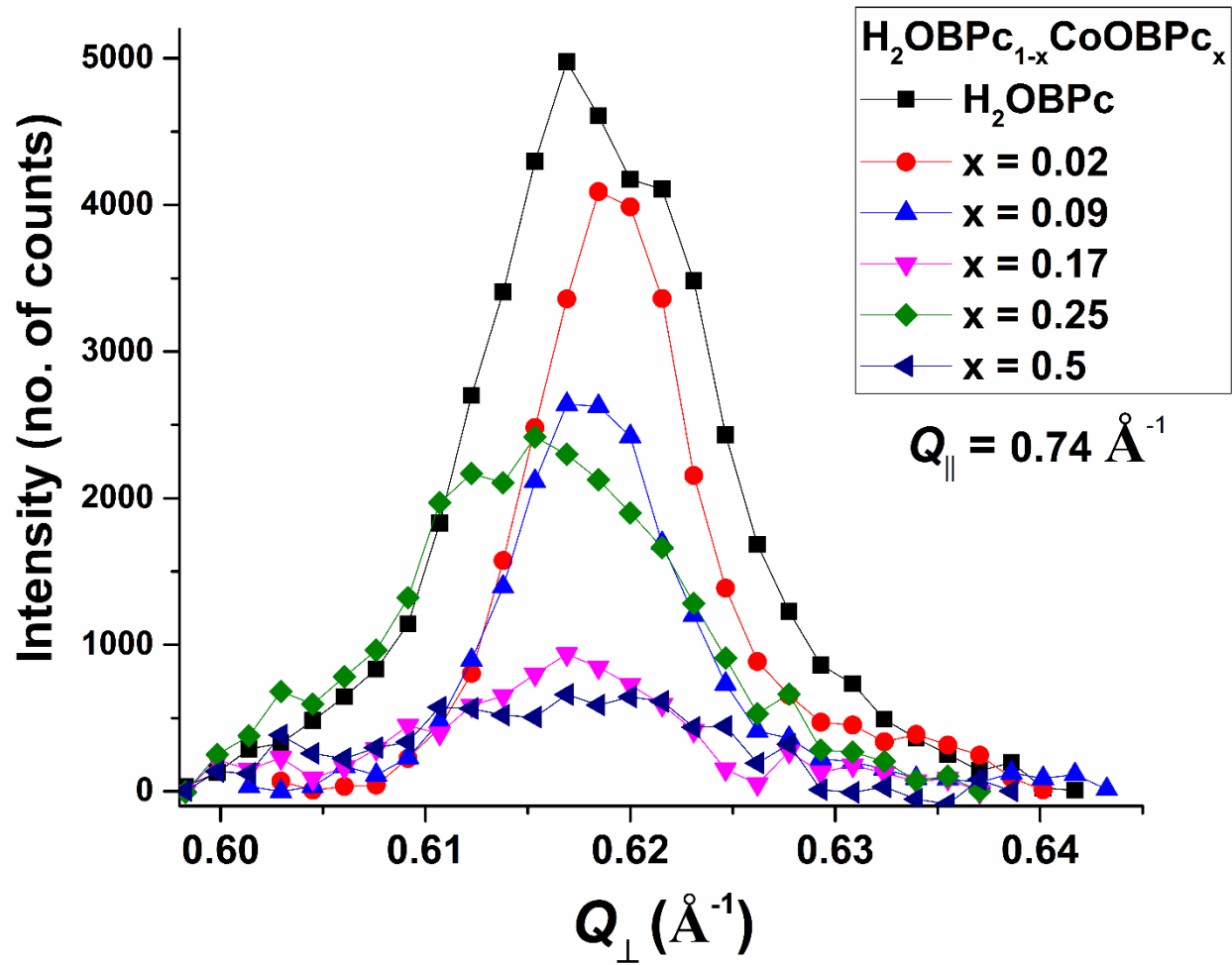


Figure S1. (110) H_2OBPc GIXRD Peak Intensity vs. Q perpendicular for varying concentrations of $\text{H}_2\text{OBPc}_{1-x}\text{CoOBPc}_x$ thin film samples. The plot was generated from the scattering map in **Figure 7** (main text) by horizontally binning twenty pixels centered at $Q_{\parallel} = 0.74 \text{\AA}^{-1}$.

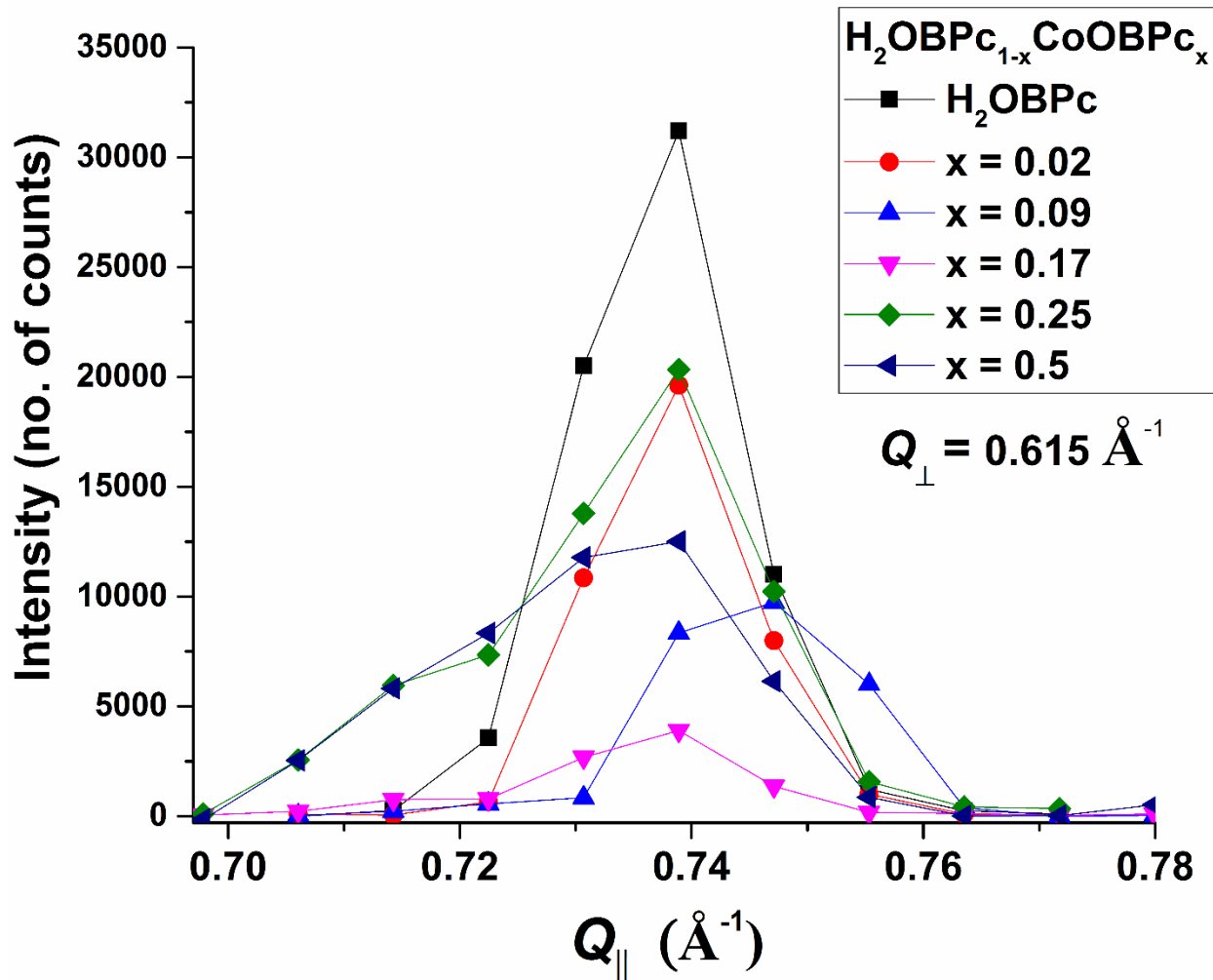


Figure S2. (110) H_2OBPc GIXRD Peak Intensity vs. Q parallel for varying concentrations of $\text{H}_2\text{OBPc}_{1-x}\text{CoOBPc}_x$ thin film samples. The plot was generated from the scattering map in **Figure 7** (main text) by vertically binning ten pixels centered at $Q_{\perp} = 0.615 \text{ \AA}^{-1}$.

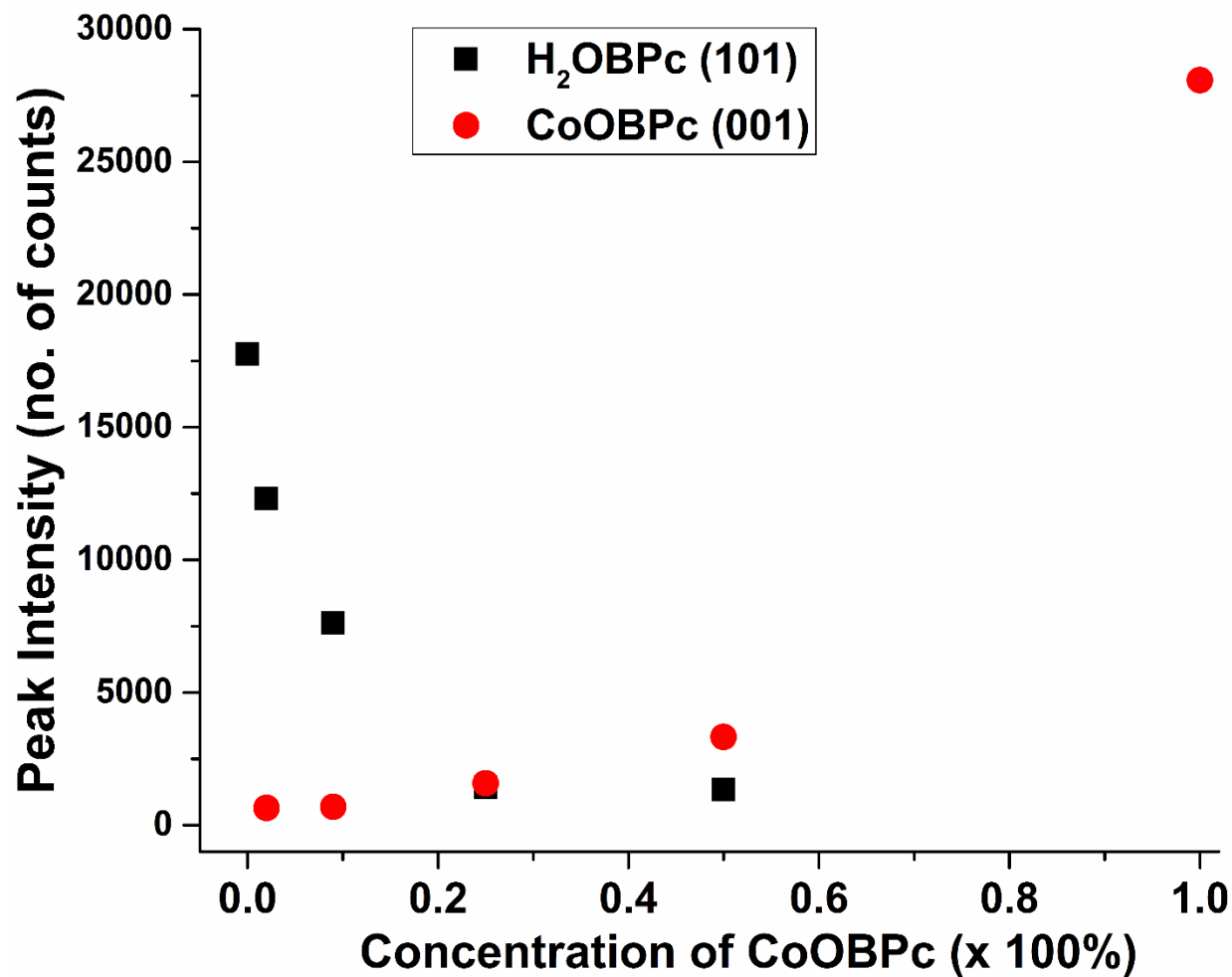


Figure S3. Peak GIXRD Reflection Intensity vs. Concentration of CoOBPc for the (101) reflection of H_2OBPc and the (001) reflection of CoOBPc in $\text{H}_2\text{OBPc}_{1-x}\text{CoOBPc}_x$ thin film samples.

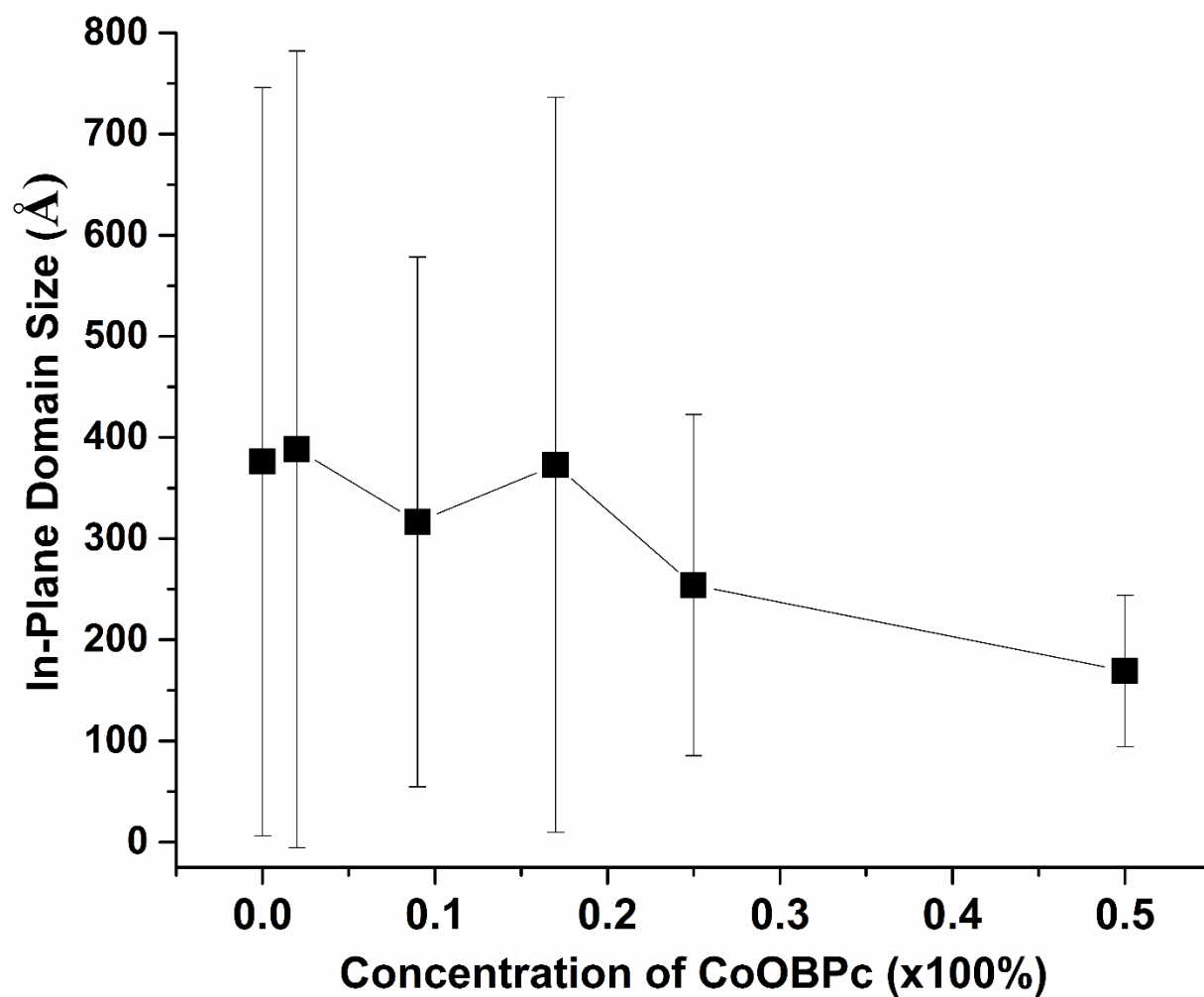


Figure S4. Estimated in-plane domain size vs. concentration of CoOBPc for the (110) GIXRD reflections of $\text{H}_2\text{OBPc}_{1-x}\text{CoOBPc}_x$ crystalline thin film samples. Error bars are on the order of the estimated domain sizes, as a result of the resolution limit of the experiment.

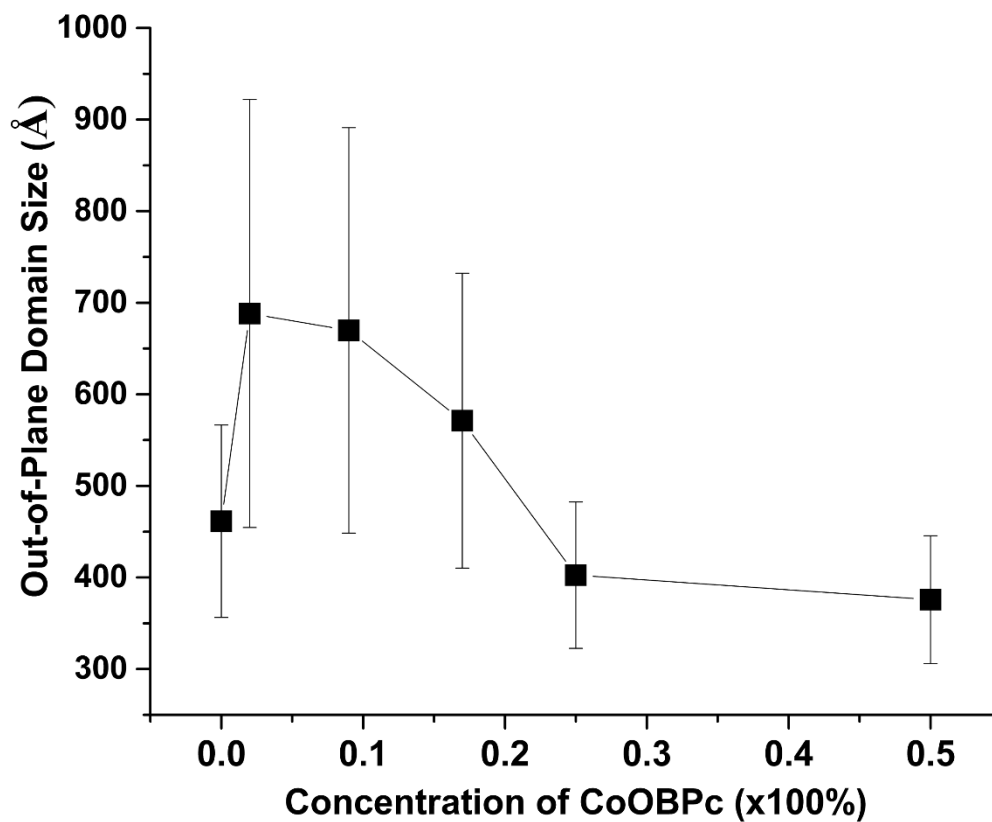


Figure S5. Estimated out-of-plane domain size vs. concentration of CoOBPc for the (110) GIXRD reflections of $\text{H}_2\text{OBPc}_{1-x}\text{CoOBPc}_x$ crystalline thin film samples. Error bars are on the order of the estimated domain sizes, as a result of the resolution limit of the experiment.

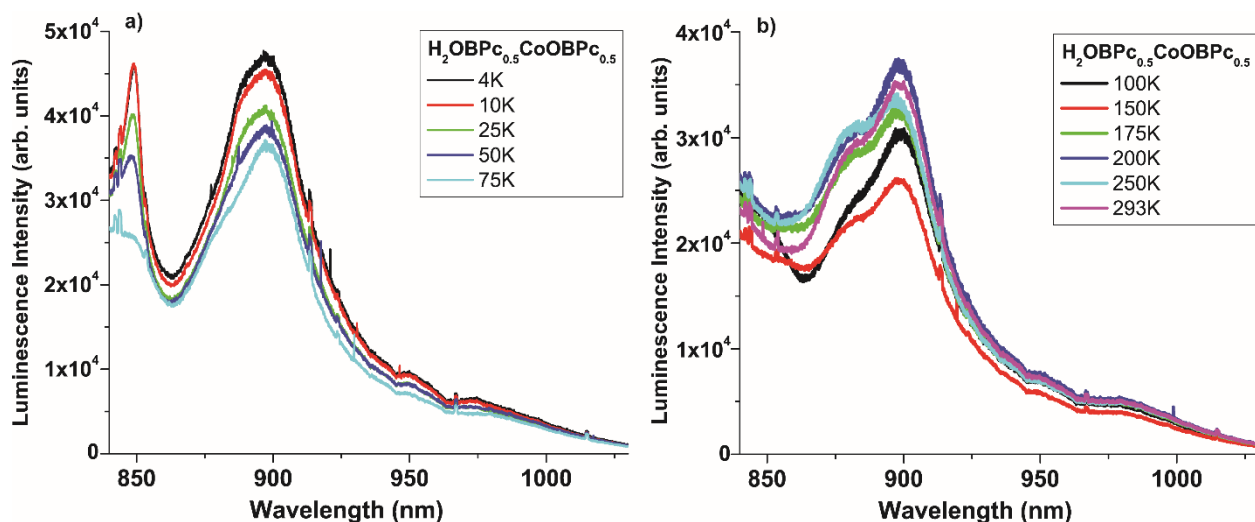


Figure S6. Temperature-dependent luminescence of a crystalline thin film of $\text{H}_2\text{OBPc}_{0.5}\text{CoOBPc}_{0.5}$ from a) 4 K-75 K and b) 100 K-293 K.

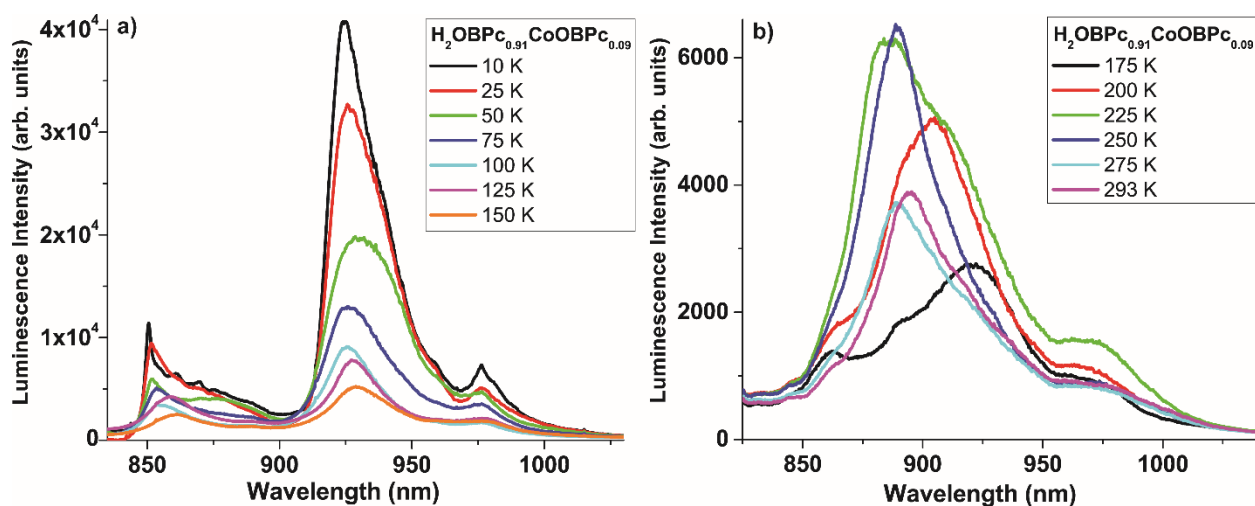


Figure S7. Temperature-dependent luminescence of a crystalline thin film of $\text{H}_2\text{OBPc}_{0.91}\text{CoOBPc}_{0.09}$ from a) 4 K-150 K and b) 175 K-293 K.

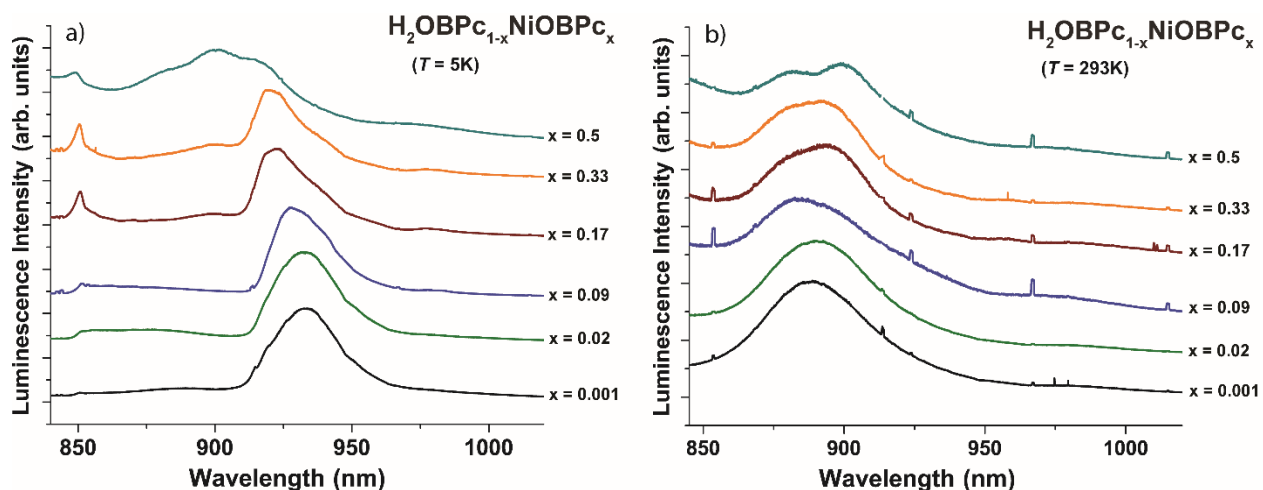


Figure S8. a) Luminescence spectra of six different concentrations of $\text{H}_2\text{OBPc}_{1-x}\text{NiOBPc}_x$ at a) 5 K and b) room temperature. The corresponding concentrations of NiOBPc are listed next to each spectrum.

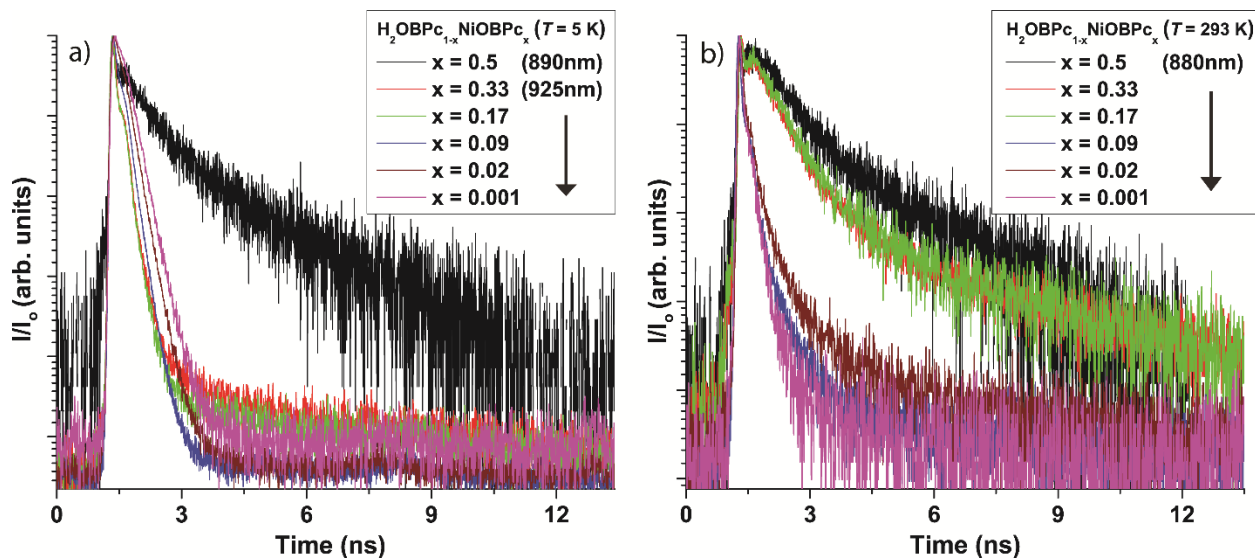


Figure S9. a) Time-resolved delocalized excitonic photoluminescence decay of six different ratios of $\text{H}_2\text{OBPc}_{1-x}\text{NiOBPc}_x$ at a) 5 K and b) room temperature. The corresponding concentrations of NiOBPc are listed in the legend.

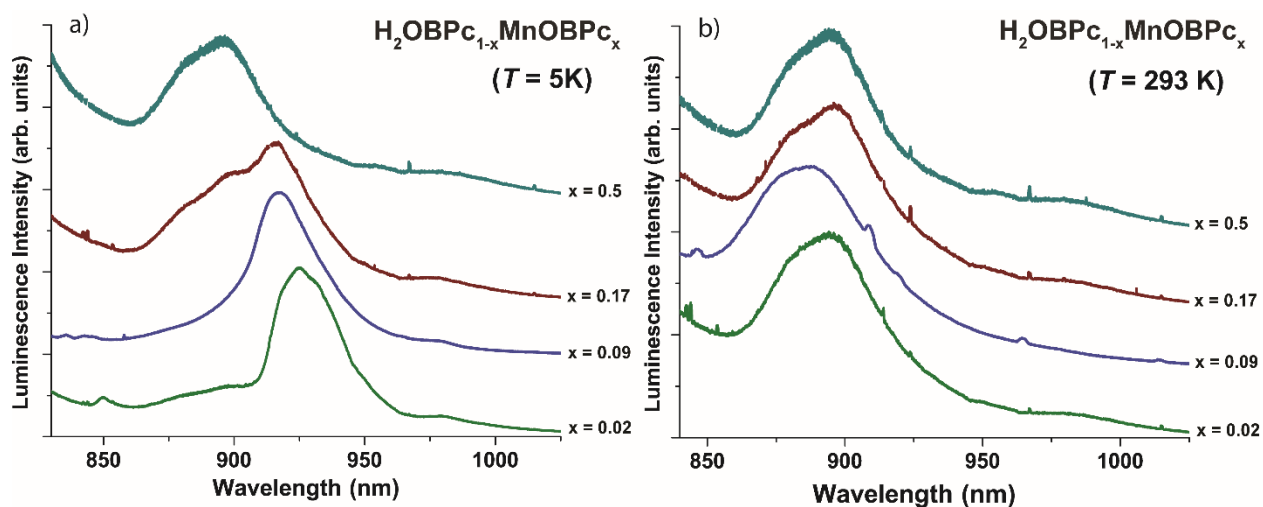


Figure S10. a) Luminescence spectra of four different ratios of $\text{H}_2\text{OBPc}_{1-x}\text{MnOBPc}_x$ at a) 5 K and b) room temperature

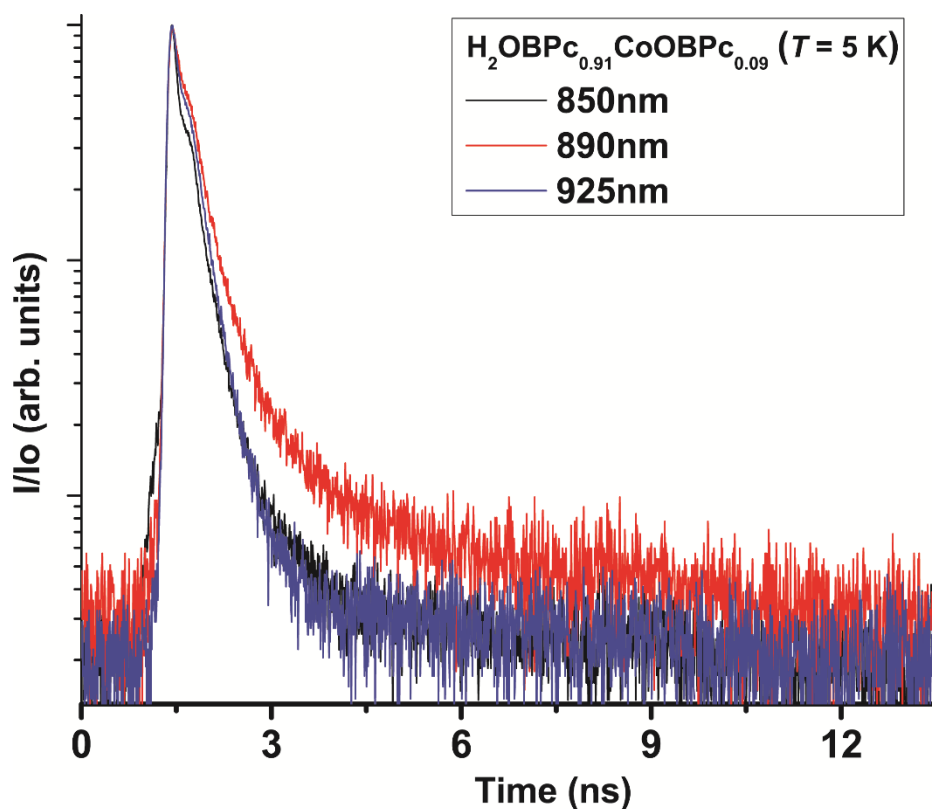


Figure S11. Time-resolved excitonic photoluminescence decay for the three features present in the $\text{H}_2\text{OBPc}_{0.91}\text{CoOBPc}_{0.09}$ film spectrum at 5 K