Supplementary Material

The data presented in the recent work by Lin et al.[1] was collected using commercial 98% purity 2,5 dihydroxybenzoic acid (DHB) and THAP. Since luminescent impurities at much lower concentrations than 2% can degrade or distort photophysical measurements, it was considered important to investigate the quality of the commercial substances. Emission spectra of MALDI matrix substances have been reported by various authors, all of whom obtained different results than those reported by Lin et al.[2,3,4,5] The spectrum of the 98% material is broader and has a maximum more to the red.[1] Our raw 98% DHB (Sigma-Aldrich) sample was similar, but the sublimed material was much like the earlier reports.

A similar trend can be observed in Figure S1 for THAP. As is evident, the unpurified emission is substantially to the red of the purified, consistent with fluorescent trapping impurities.

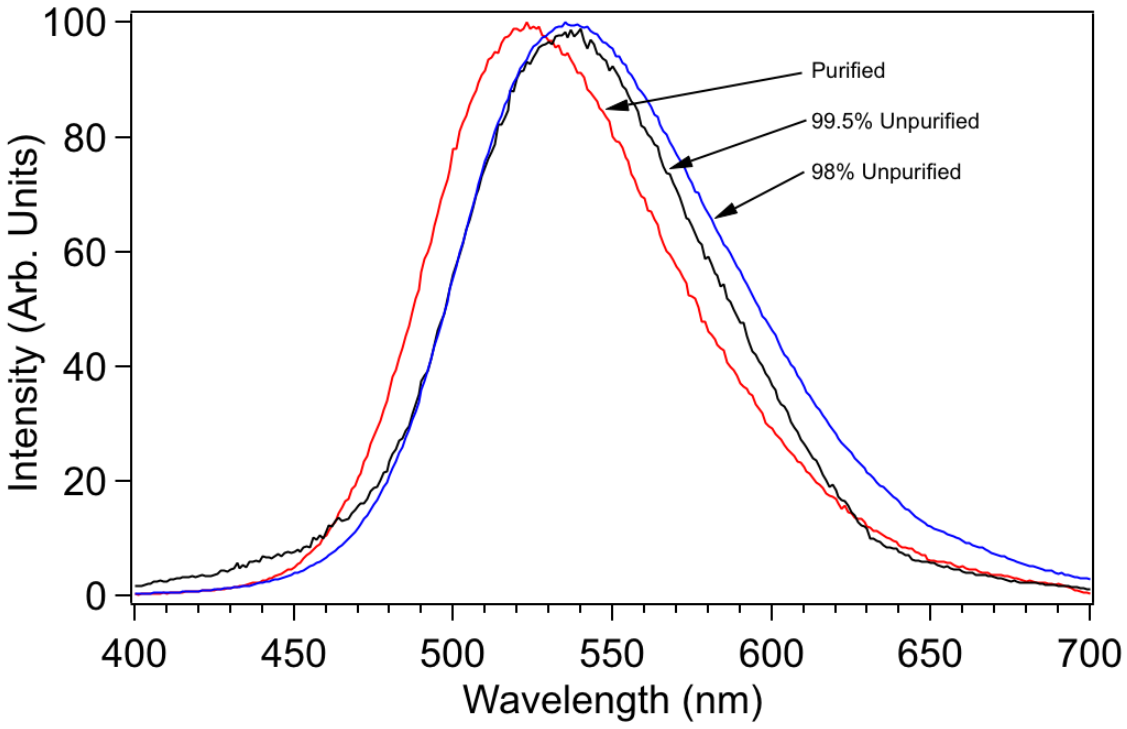

Figure S1. Normalized emission spectra of the purified and unpurified THAP measured in the solid state. 337 nm excitation was used and both excitation and emission slit widths were set to 2 nm.

The decay curves of unpurified THAP are consistent with (quenching) impurities, as shown in Fig. S2. Higher purity results in substantially longer fluorescence lifetime. The quantum yield of phosphorescence is also greater. Also evident is the low signal/noise ratio of the 98% data, and it's very limited extent, which make both fast and slow nonexponentialites difficult or impossible to observe.

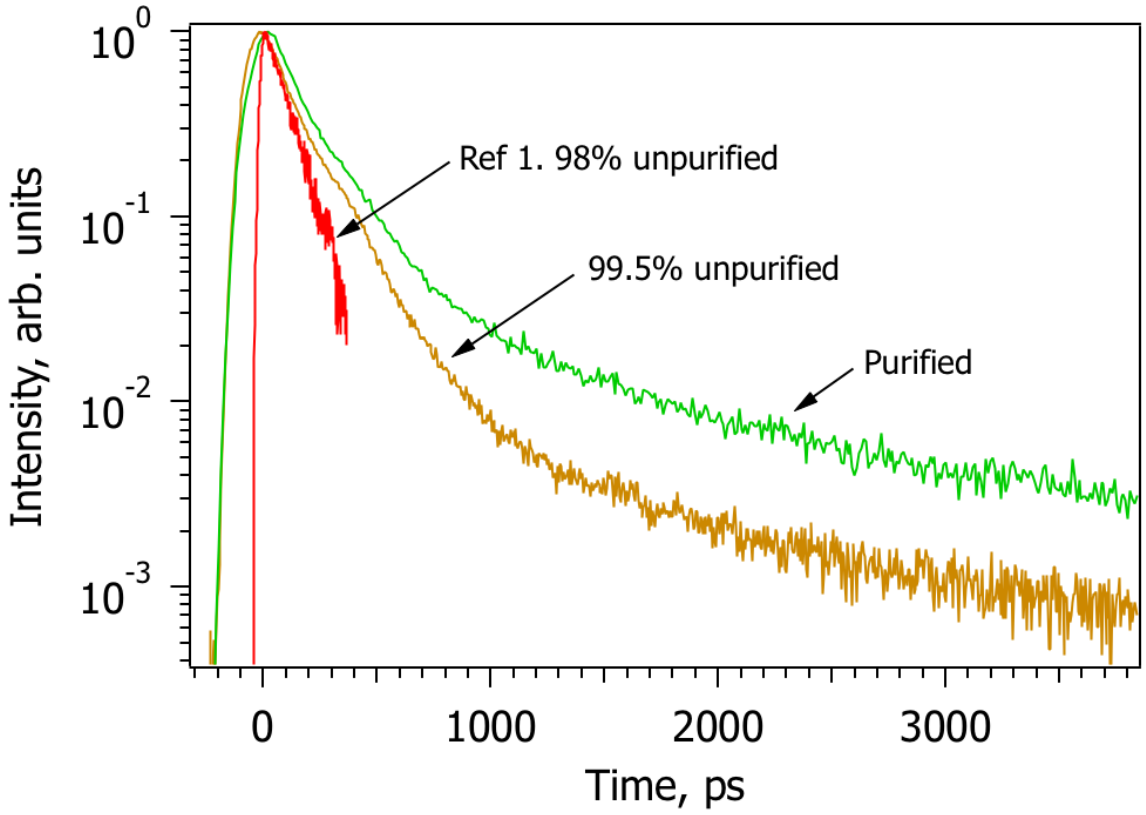

Figure S2. Decay curves of purified and unpurified THAP measured in the solid state. See the main manuscript for experimental details.

References

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