Electronic Supplementary Information

A charged iridophosphor for time-resolved luminescent CO$_2$

gas identification

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Fig. S1 Changes in the phosphorescence intensity of a solution of complex 1 in CH$_3$CN (10 μM) containing CH$_3$COO$^-$ (3 equiv.) with various quantities of CO$_2$ gas. $I_{min}$ represents the phosphorescence intensity (at 596 nm) of 1 with 3 equiv. CH$_3$COO$^-$ $I_{max}$ represents the phosphorescence intensity (at 596 nm) of 1 with 3 equiv. CH$_3$COO$^-$, followed by bubbling with 15 mL CO$_2$ gas.
**Fig. S2** A plot of PL intensity of 1 versus fraction of CO$_2$ ($f_{CO_2}$) in CO$_2$/N$_2$ mixtures.

**Fig. S3** Fluorescence lifetime decay profiles of (a) rhodamine B and (b) complex 1 with CH$_3$COO$^-$ followed by treatment with CO$_2$ gas in CH$_3$CN using the TCSPC method with an excitation wavelength of 365 nm.
Fig. S4 PL spectra of rhodamine B in CH$_3$CN with an excitation wavelength of 365 nm.

Fig. S5 $^1$H NMR spectra of L, L+CH$_3$COO$^-$ and L+CH$_3$COO$^- + CO_2$ in DMSO-$d_6$. 
Fig. S6 (a) Proposed formation of the CS$_2$ adduct of 2-phenylimidazo-[4,5-$f$][1,10]phenanthroline. (b) $^{13}$C NMR spectra of L and L-CS$_2$ K$^+$ in DMSO-$d_6$. 