SUPPLEMENTARY INFORMATION

Light-triggered and cysteine-mediated nitric oxide release from a biodegradable starch-based film

Antonio Carlos Roveda Jr.*, Helena de Fazio Aguiar#, Katrina M. Miranda‡,
Carmen Cecília Tadini#, Douglas Wagner Franco†*.

†Instituto de Química de São Carlos, Universidade de São Paulo – USP, P.O.Box 780, CEP 13566-590, São Carlos, SP, Brazil

#Department of Chemical Engineering, Escola Politécnica, University of São Paulo, Av. Prof. Luciano Gualberto, Travessa 3, n° 380, São Paulo, SP, Brazil

‡Department of Chemistry and Biochemistry, University of Arizona, Tucson, Arizona 85721, United States

Corresponding Author

*E-mail: douglas@iqsc.usp.br
**Figure S1.** FT-IR spectra of native and modified (crosslinked with 15% STMP) starch.

**Fig. S2.** FT-IR cell holder used for photolysis of CS films.
Fig. S3. FT-IR of CS$_x$-RuNOisn with different RuNOisn contents/film (in μmol of RuNOisn/film). Concentrations of 5, 10, 15, 20, 30, 50 μmol RuNOisn/film are represented respectively by the spectra with labels “a” to “f”. Inset: plot of RuNOisn content/film vs. NO stretch absorbance, R$^2 = 0.9905$.

Fig. S4. Photograph of a cassava starch film containing trans-[Ru$^{II}$(NH$_3$)$_4$(isn)(NO$^+$)](BF$_4$)$_3$. 
Fig. S5. Spectral changes during photolysis of CS film containing \( \text{trans-[Ru(NH}_3)_4(\text{isn})(^{15}\text{NO}_+)] } \). Conditions: \( \lambda_{\text{irr}} = 355 \text{ nm}, 5 \text{ mJ/pulse} \).
Fig. S7. (A) Spectral changes during a second cycle of irradiation of CS$_{50}$-RuNOisn ($\lambda_{\text{irr}} = 355$ nm, 5 mJ/pulse). The inset shows the changes in the absorbance at 1935 cm$^{-1}$ during photolysis. (B) Second regeneration of photolyzed CS$_{50}$-RuNOisn after reaction with 1.0 mM nitrite.
Fig. S8 – Photolysis of a ruthenium-free starch-based film dipped in aqueous nitrite solution. Conditions: Film immersed in solution of sodium nitrite (10.0 mM) for 20 min. Photolysis: $\lambda_{\text{irr}} = 355$ nm, 5mJ/ pulse, a pulse every 2 seconds.
Fig. S9. (A) Real time NO release profile and (B) plot of $t[\text{NO}]$ vs. time for cysteine-initiated NO release from RuNOisn. Conditions: 1.77 μmol of RuNOisn, TRIS buffer 0.150 M, 5 mM EDTA, pH 7.4 at 37 ºC. $[\text{NO}]_{\text{max}}$ = maximum flux of NO release; $t[\text{NO}]_{\text{max}}$ = the time until $[\text{NO}]_{\text{max}}$. 