Electronic Supplementary Material (ESI) for ChemComm.

Chemical Parameters	**purity**	reagent purity: > 98 %		
	concentrations and molar amounts	Photosensitizer:	$[Ru(bpy)_3]PF_6$ / $[Ru(^{tert}butyl\text{-}bpy)_3]^{2+}$ / $[Ir(ppy)_2(bpy)]^+$	c = 20 µM, n = 160 nmol
		Catalyst:	$Na_2[Mo_3S_{13}](H_2O)_5$	c = 0.3 µM, n = 2.4 nmol
		Catalyst:	$Co(dmgH)_2PyCl$	c = 4 µM, n = 32 nmol
		Sacrificial Reagent:	Ascorbic Acid / N-benzyl-1,4-dihydronicotineamide	c = 10 mM, n = 80 µmol
		Solvent/buffer:	9:1 sovent:water (v:v), solvent is MeOH or Acetone	
	pH-value/proton concentration	pH 4 or pH 6		
Reactor	**materials**	borosilicate glass		
	geometry	Schlenk tube		
	dimensions	h = 15 cm, d = 2 cm, V *ca.* 21 mL		
Experimental Setup	**positioning**	light-beam path perpendicular to reactor glass wall, d (light-source, front reactor wall) = 0 cm, two custom-built LED-sticks opposing each other, air cooling		

Operation Conditions	**reaction volume**	V = ca 21 mL	headspace: V = ca 13 mL	
	temperature	T = 22 ^{o}C, throughout the reaction		
	atmosphere and pressure	argon atmosphere, p_0 = 998 - 1002 mbar		
	operation mode	batch mode		
	stirring speed	no stirring		
	flow rates	n.a.		
	reaction time	6 h		
Light Source	**Wavelength**	λ_{max} = 470 nm		
	Power	P ~ 40 mW cm^{-2}		
Performance Indicators	**Δn (product)**	see main manuscript		
	TON	see main manuscript		
	TOF	see main manuscript		