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Fig. S1 CV curves and structures of mononuclear Ru(II)/Ir(III) compounds (DMF, 1 × 10⁻⁵ mol L⁻¹), and detailed redox potentials of the binuclear and mononuclear compounds.
a) $H_2/\mu\text{mol}$

- DMF+H$_2$O(v/v, 1:1)
- DMF
- DMSO+H$_2$O(v/v, 1:1)
- DMSO

Time/h

b) $H_j/\mu\text{mol}$

- TEA
- TEOA
- EDTA
- Ascorbic acid

Time/h
Fig. S2 Photocatalytic H$_2$ production results of IrRu(1) as PS under different conditions, (a) different solvents (PS, 50 μM; WRC, 1mg; SR, TEA, 0.72 M), (b) different SRs (PS, 50 μM; WRC, 1mg; solvent, DMSO), (c) different concentrations of PS (WRC, 1mg; SR, TEA, 0.72 M; solvent, DMSO).
Fig. S3 MS spectra of the photocatalytic system containing IrRu(1) as photosensitizers, showing the persistence of IrRu(1) component in the solution before (top) and after (bottom) photocatalytic process.