

Electronic Supplementary Information

**Visible light-induced enzymatic reactions using a NADH
regeneration system of water-soluble porphyrin and
homogeneously rhodium nanoparticles**

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Experimental section

TEM measurement of Rh-PVP

Transmission electron microscopy (TEM) was conducted to gain morphological information about the Rh nanoparticles in the catalyst. The particle size of Rh-PVP was estimated using TEM Image. For the transmission electron microscopy (TEM) measurements, a drop of the sample solutions was mounted on a carbon-covered copper mesh. The TEM images of Rh-PVP were recorded with a JEM-2100F (JEOL) electron microscope operated at 200 kV.

Fluorescence quenching behavior of ZnTPPS by Rh-PVP or NAD⁺

Quenching of photoexcited state of ZnTPPS by Rh-PVP or NAD⁺ was investigated using steady state fluorescence spectroscopy. The sample solution contained ZnTPPS (1.0 μM) and Rh-PVP (250 μM) or NAD⁺ (1.25 mM) in 50 mM HEPES-NaOH buffer (pH 7.4). The excitation wavelength was 422 nm due to the Soret band of ZnTPPS. The fluorescence emission spectrum of ZnTPPS was measured using a fluorescence spectrophotometer (SHIMADZU, RF-5300PC) with a 150 W Xenon lamp as a visible excitation light source. Excitation and emission band-passes were 5.0 nm.

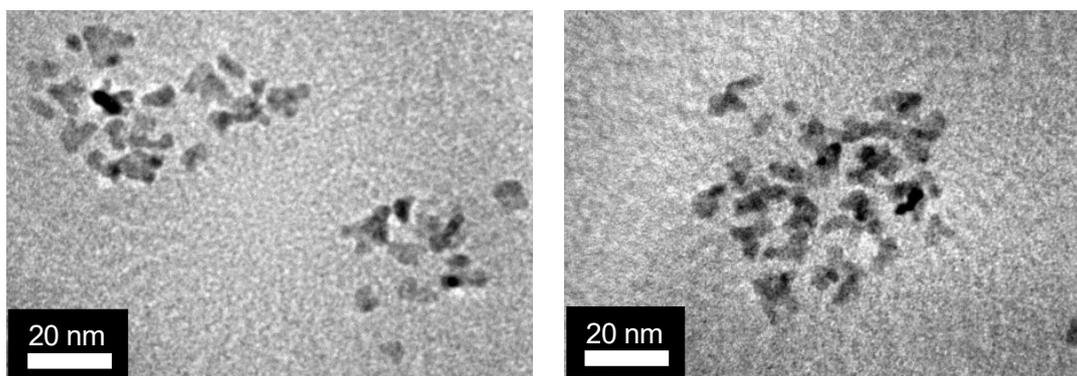


Fig. S1. TEM images of Rh-PVP.

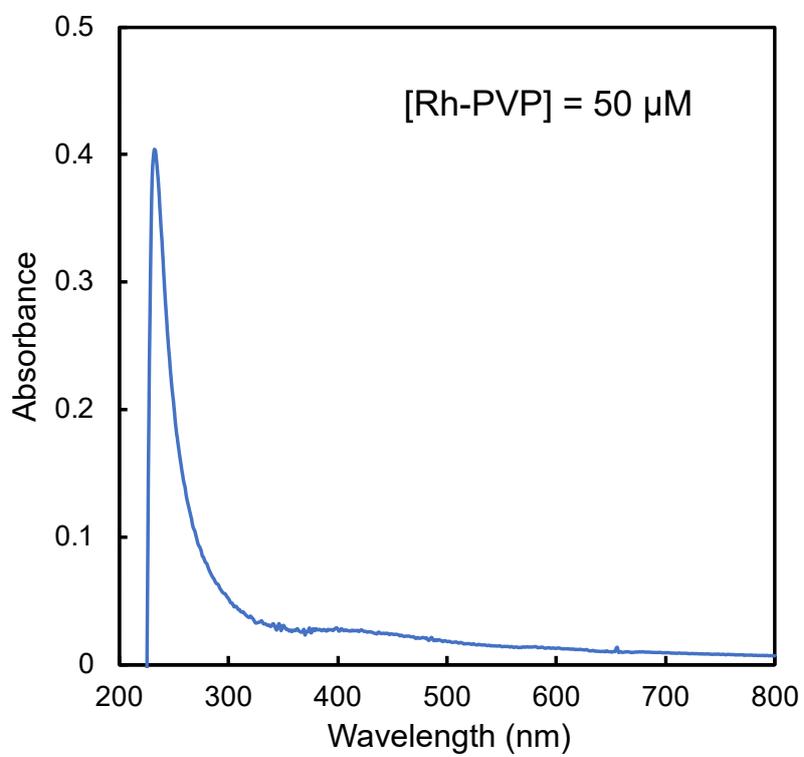


Fig. S2. UV-Vis absorption spectrum of Rh-PVP.

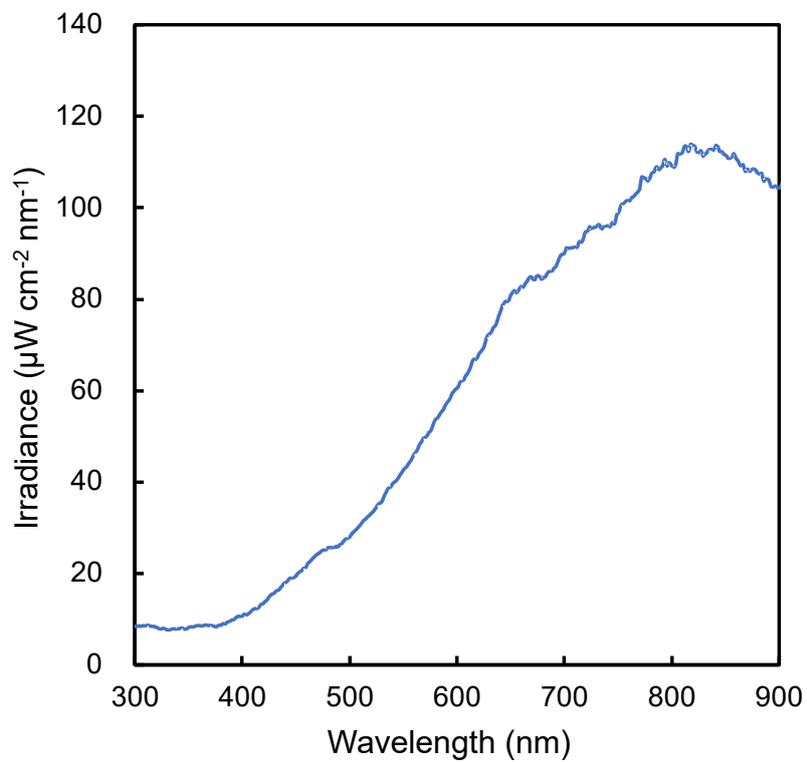


Fig. S3. Irradiance spectrum of halogen lamp.

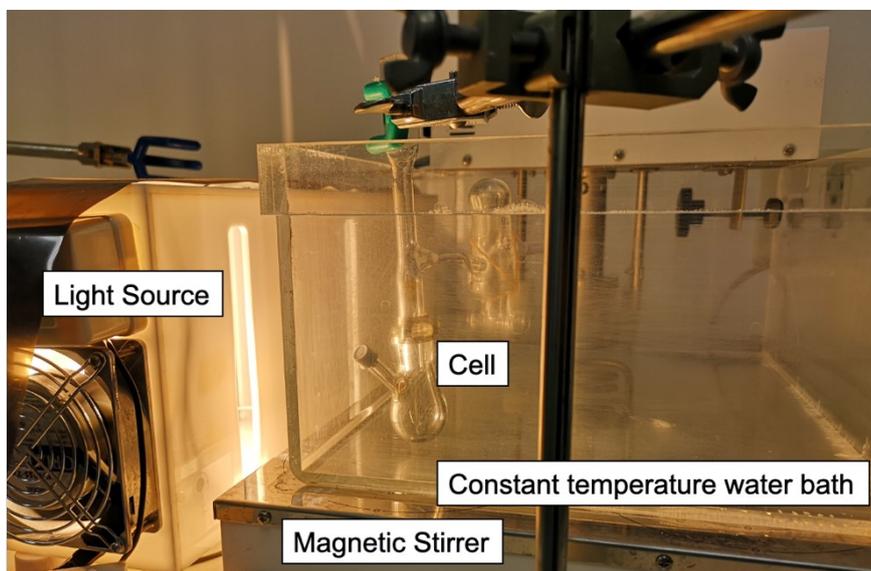


Fig. S4. The outline of an experimental setup for NAD⁺ regeneration.

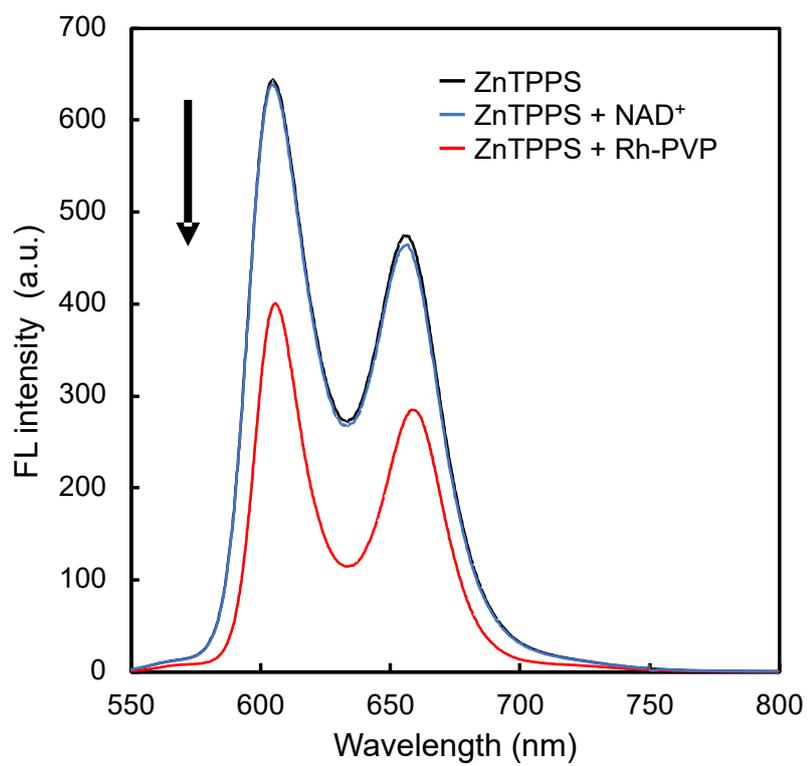


Fig. S5. Fluorescence spectra of ZnTPPS (1.0 μM) in the presence and absence of Rh-PVP (250 μM , —red) or NAD^+ (250 μM , —blue) in HEPES-NaOH buffer (pH 7.4).