

Supporting Information

Synthesis of Mesoporous Silica Supported Ag Nanorods-based Bimetallic Catalysts and Investigation of their Plasmonic Activity under Visible Light Irradiation

Priyanka Verma,^a Yasutaka Kuwahara,^{a,b} Kohsuke Mori,^{a,b,c} and Hiromi
Yamashita^{a*,b}

^a Division of Materials and Manufacturing Science, Graduate School of Engineering,
Osaka University, 2-1 Yamadaoka, Suita, Osaka 565-0871, Japan.

^b Elements Strategy Initiative for Catalysts & Batteries (ESICB), Kyoto University,
Kyoto University, Katsura, Kyoto 615-8520, Japan.

^c JST, PRESTO, 4-1-8 Honcho, Kawaguchi, Saitama, 332-0012, Japan.

*For correspondence

E-mail: yamashita@mat.eng.osaka-u.ac.jp

Tel: +81-6-6879-7457

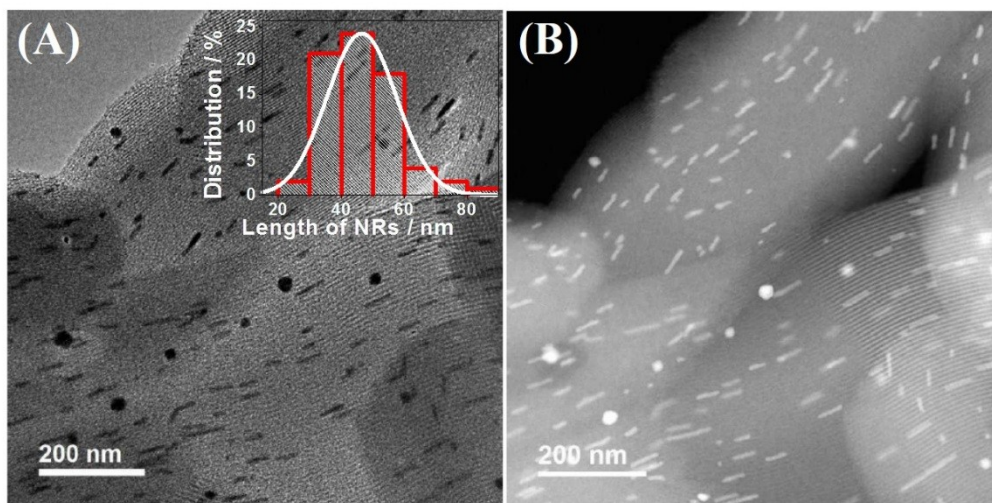


Fig S1. TEM image along with length distribution histogram and HAADF-STEM image for Ru/Ag/SBA-15.

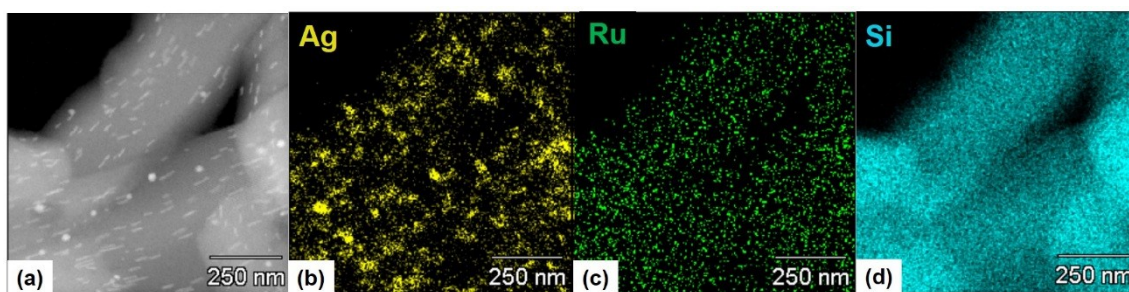


Fig. S2. (a) HAADF-STEM image of Ru/Ag/SBA-15, and Elemental mapping of (b) Ag (c) Ru and (d) Si.

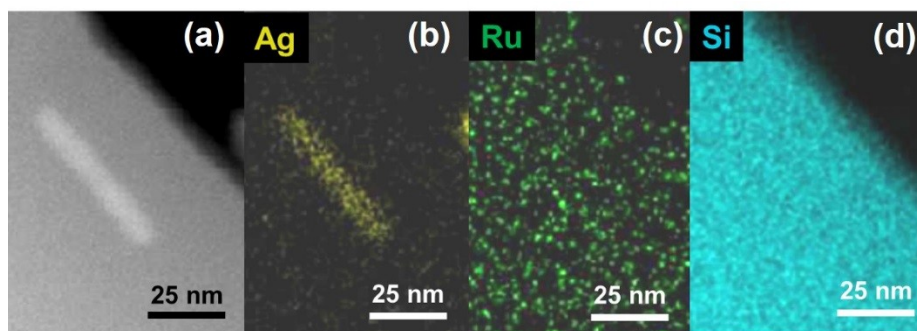


Fig. S3. (a) HR-STEM image for Ru/Ag/SBA-15 and Elemental mapping of (b) Ag (c) Ru and (d) Si.

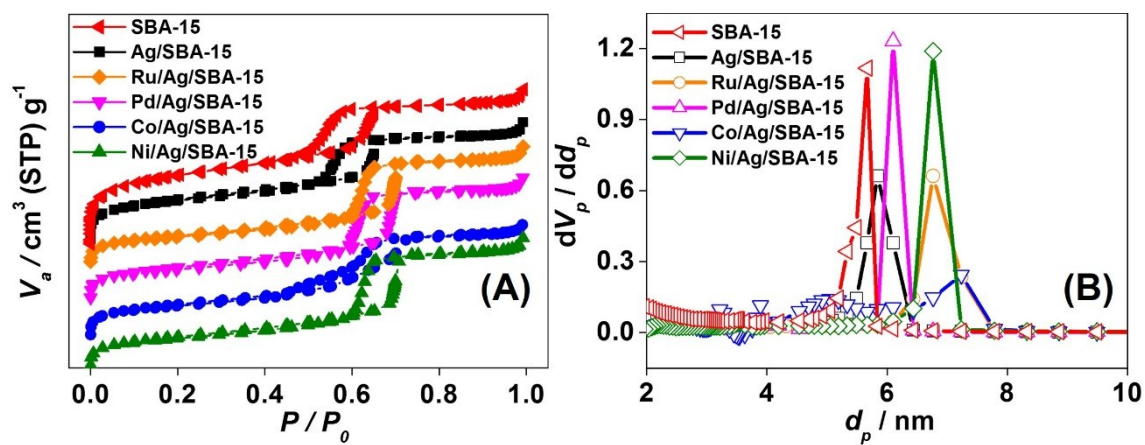


Fig. S4. (A) N_2 adsorption-desorption isotherms and (B) pore size distribution for prepared catalysts.

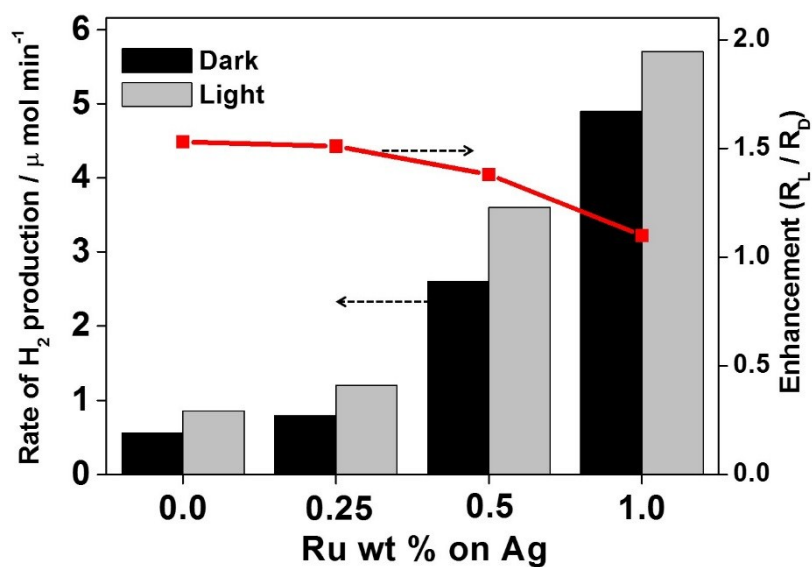


Fig. S5. Reaction rate and enhancements for AB dehydrogenation reaction over different weight percentage of Ru on Ag/SBA-15 NR.

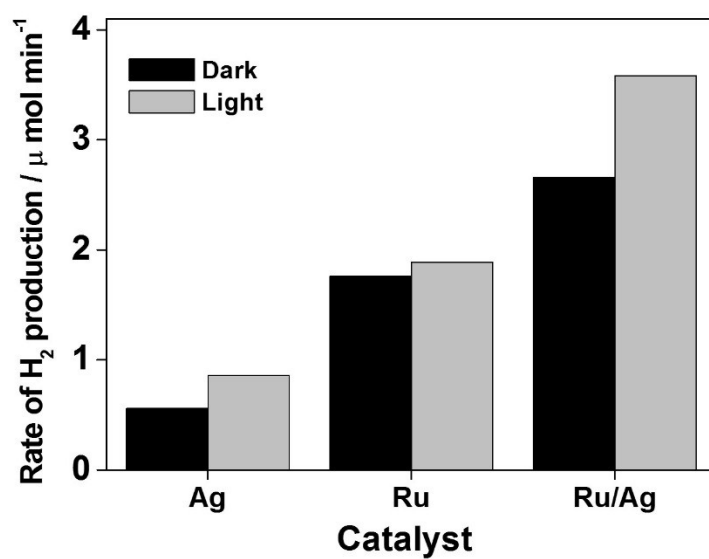


Fig. S6. Reaction rate comparison of Ag/SBA-15, Ru/SBA-15 and Ru/Ag/SBA-15 for AB dehydrogenation in dark and under visible light irradiation.

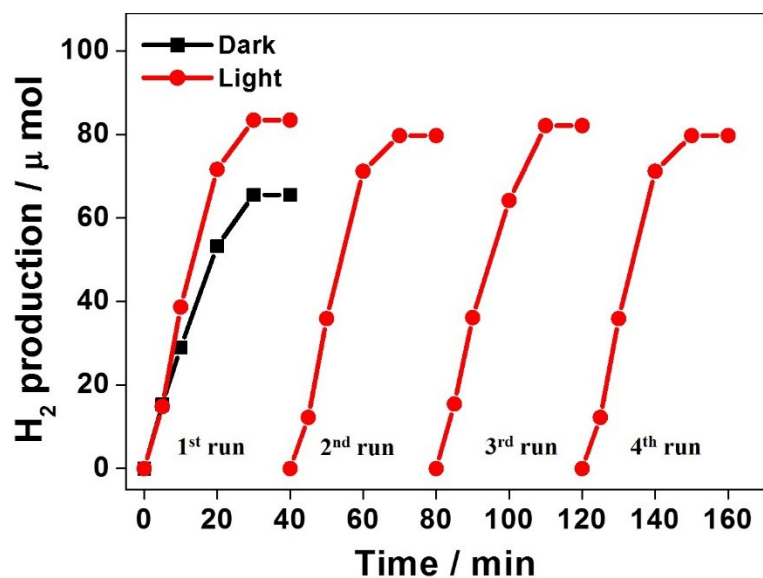


Fig. S7. Recyclability test for hydrogen production from AB over Ru/Ag/SBA-15 under dark and visible light irradiation.

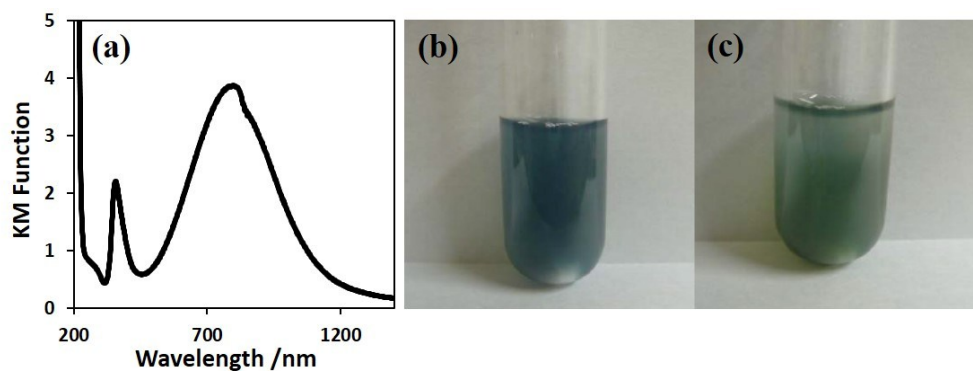


Fig. S8. (a) UV-visible spectra of Ag/SBA-15 NR after reaction of AB dehydrogenation (b) sample image aqueous solution before reaction and (c) after reaction.

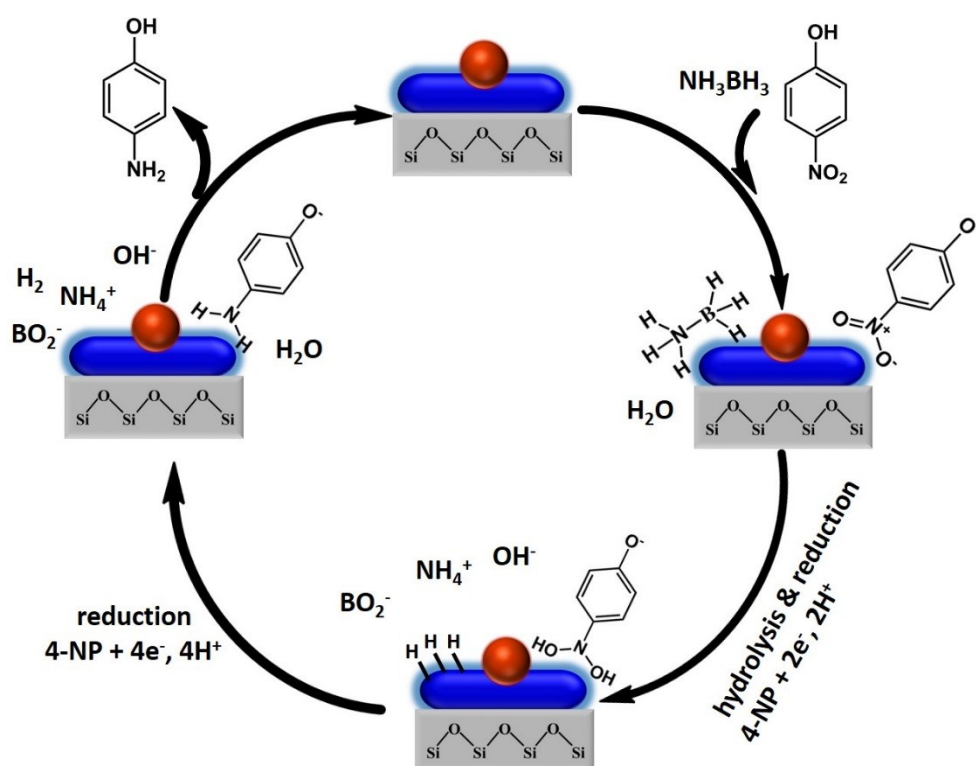


Fig. S9. A plausible catalytic pathway for 4-NP reduction using AB by M/Ag/SBA-15 nanocatalysts.

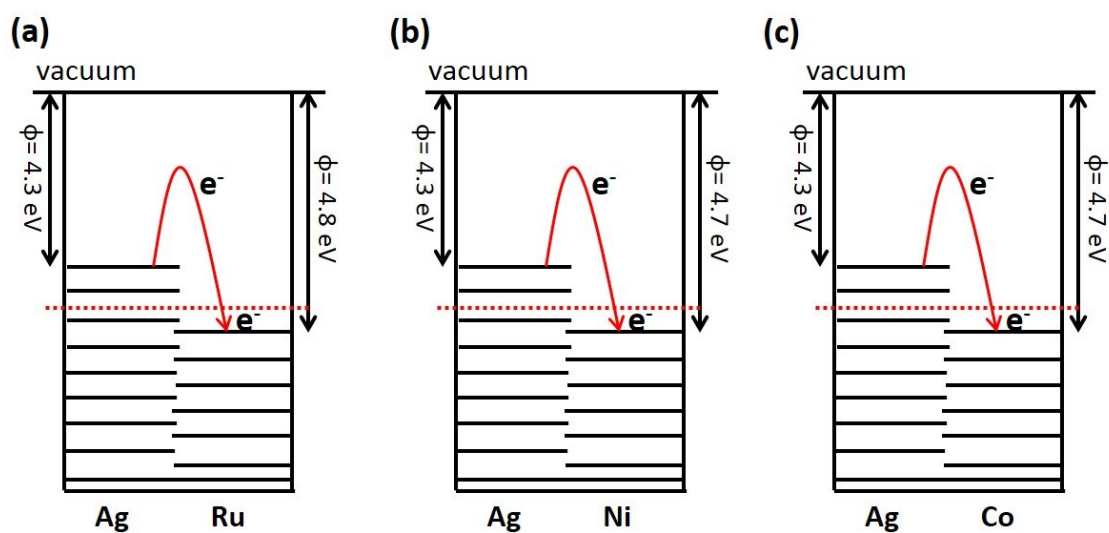


Fig. S10. Work function and fermi energy level distribution of Ag NRs with (a) Ru (b) Ni and (c) Co.