

Fig. 1. TEM images of MARIMO TiO₂ nanoparticles. Solid nanoparticles obtained at 300 °C (a) and 400 °C (b) in scMeOH in the presence of phthalic acid and (c) hollow nanoparticles obtained at 400 °C in scMeOH in the presence of formic acid.

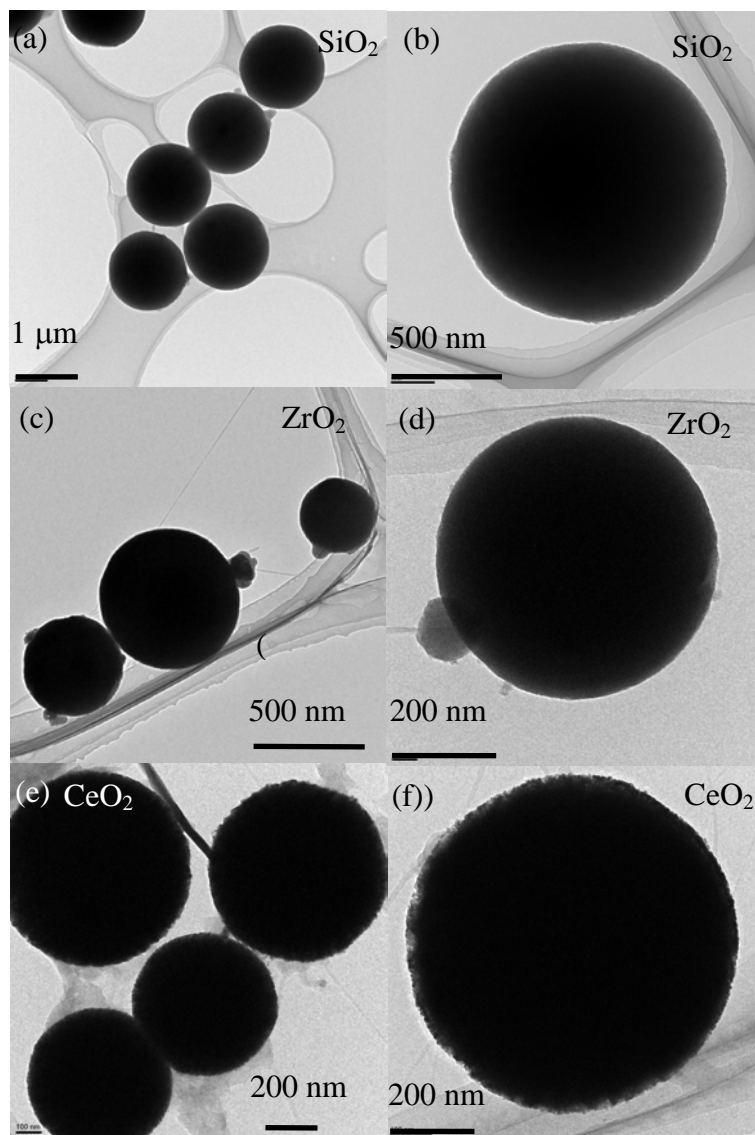


Fig. 2. TEM images of MARIMO nanoparticles prepared in a mixture of carboxylic acid and scEtOH or scMeOH: (a and b) SiO₂, (c and d) ZrO₂, and (e and f) CeO₂.

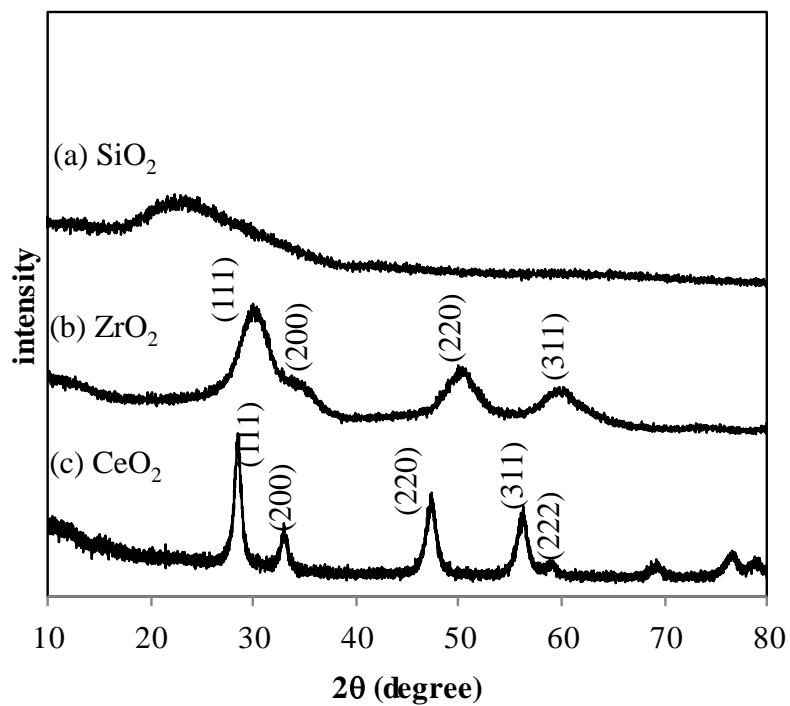


Fig. 3. Powder XRD patterns of MARIMO nanoparticles obtained in the presence of a carboxylic acid in scEtOH or scMeOH: (a) SiO_2 , (b) ZrO_2 , and (c) CeO_2 .

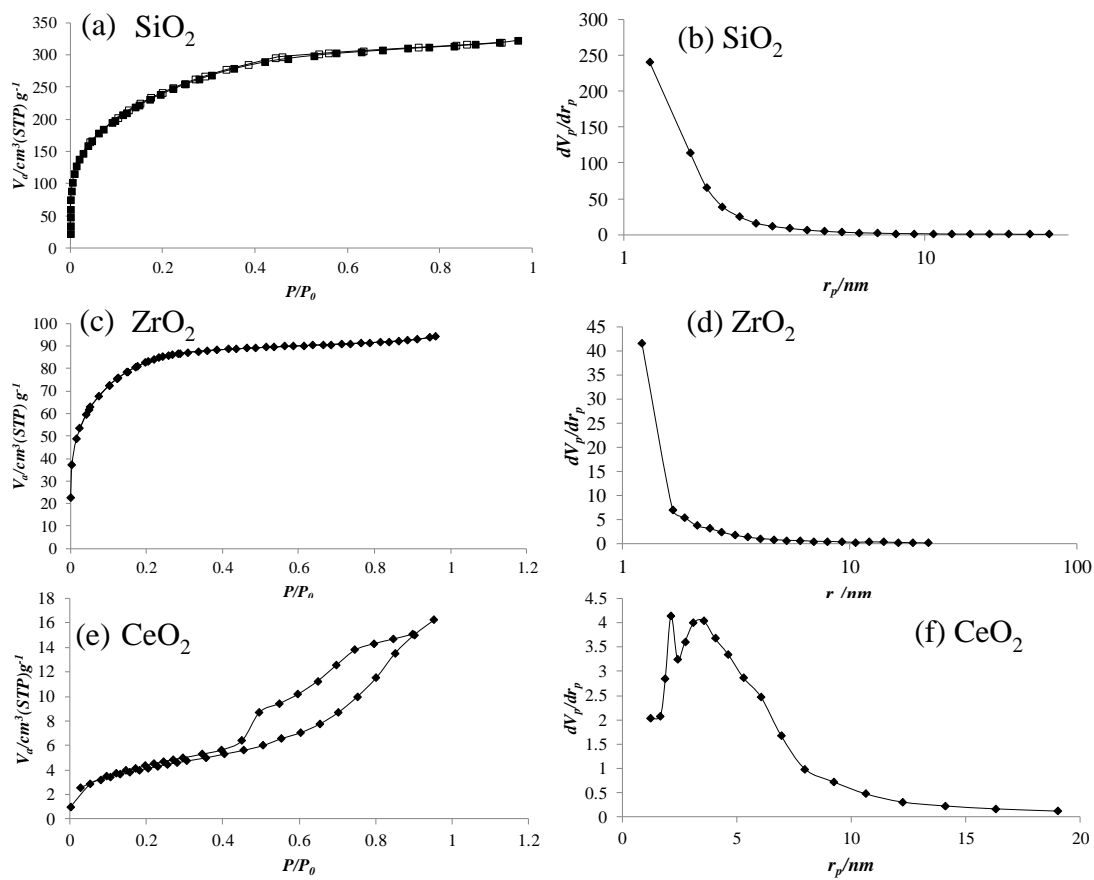


Fig. 4. Nitrogen adsorption–desorption isotherm (a, c, and e) and Barret Joyner Halenda (BJH) pore size distribution plots (b, d, and f) of the MARIMO nanoparticles: (a and b) SiO₂, (c and d) ZrO₂, and (e and f) CeO₂.

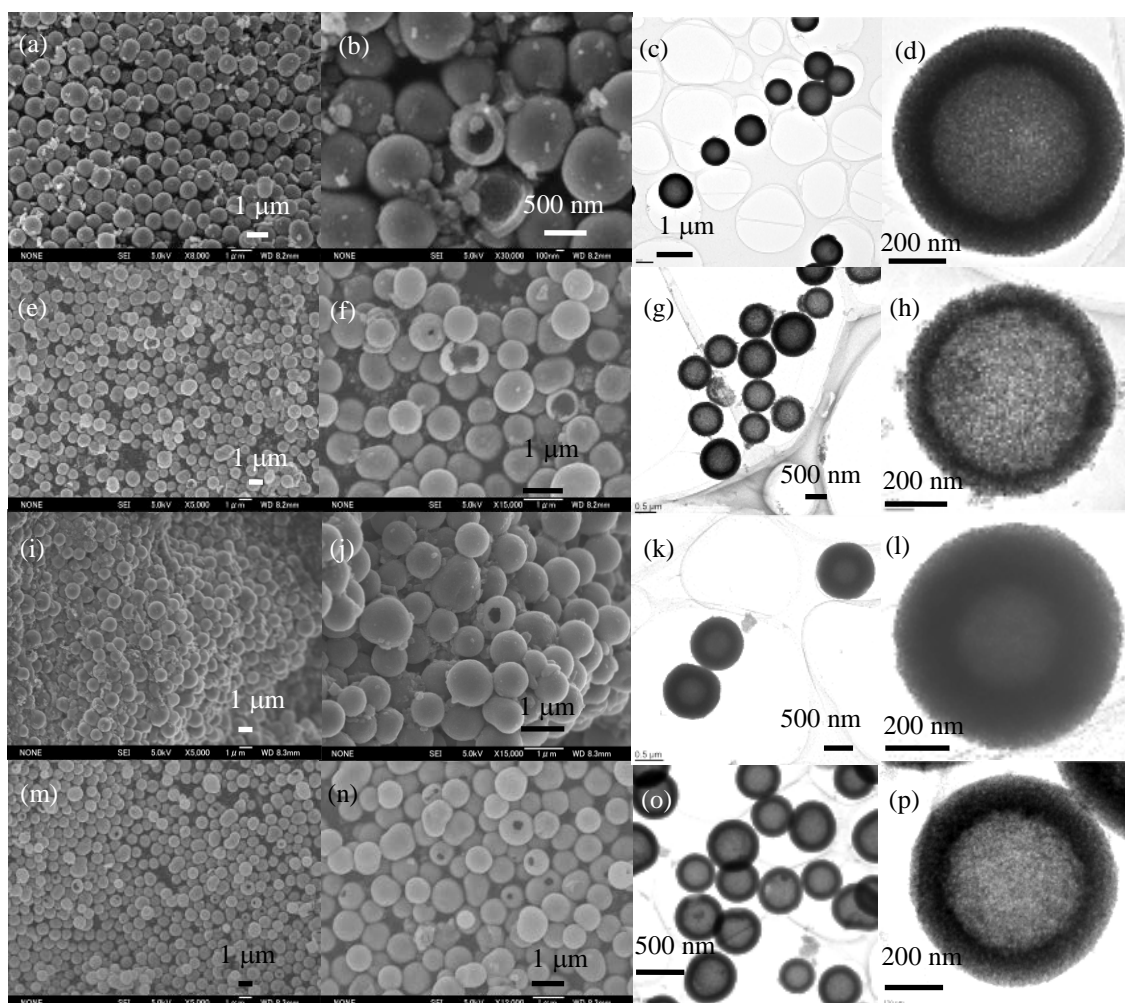


Fig. 5. FESEM and TEM images at different magnifications of the MARIMO TiO_2 nanoparticles prepared in the presence of phthalic acid in scMeOH (0.28 g mL^{-1}) under the following conditions: gradual increase of reaction temperature from room temperature to (a, b, c, and d) $300 \text{ }^\circ\text{C}$ (rate of increase, $5.4 \text{ }^\circ\text{C/min}$), (e, f, g, and h) $400 \text{ }^\circ\text{C}$ ($5.4 \text{ }^\circ\text{C/min}$), (i, j, k, and l) $300 \text{ }^\circ\text{C}$ ($2 \text{ }^\circ\text{C/min}$), and (m, n, o, and p) $300 \text{ }^\circ\text{C}$ ($10 \text{ }^\circ\text{C/min}$); final temperature maintained for 10 min.

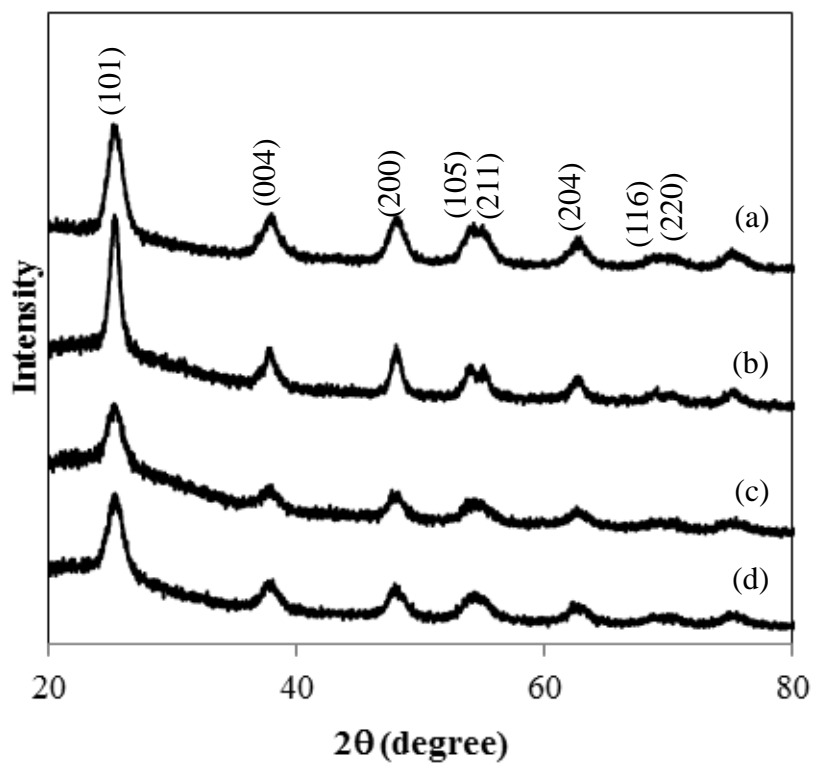


Fig. 6. Powder XRD patterns of the MARIMO TiO₂ nanoparticles prepared in a mixture of phthalic acid in scMeOH (density, 0.28 g mL⁻¹) under the following conditions: gradual increase of reaction temperature from room temperature to (a) 300 °C (rate of increase, 5.4 °C/min), (b) 400 °C (5.4 °C/min), (c) 300 °C (2 °C/min), and (d) 300 °C (10 °C/min); final temperature maintained for 10 min.

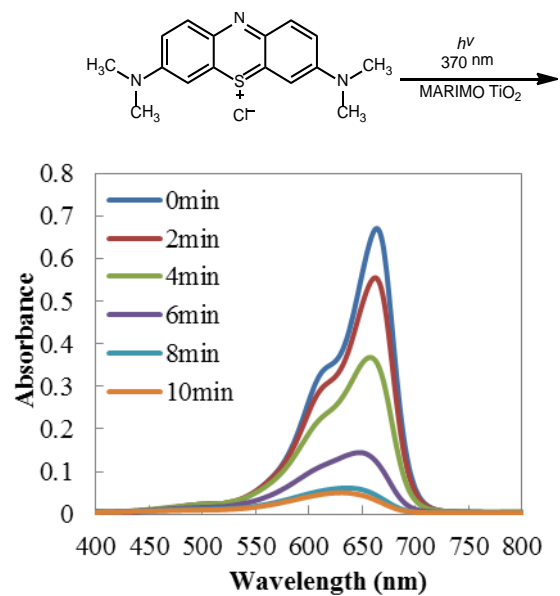


Fig. 7. Degradation of methylene blue in water in the presence of MARIMO TiO₂ as a photocatalyst under 370 nm UV irradiation.

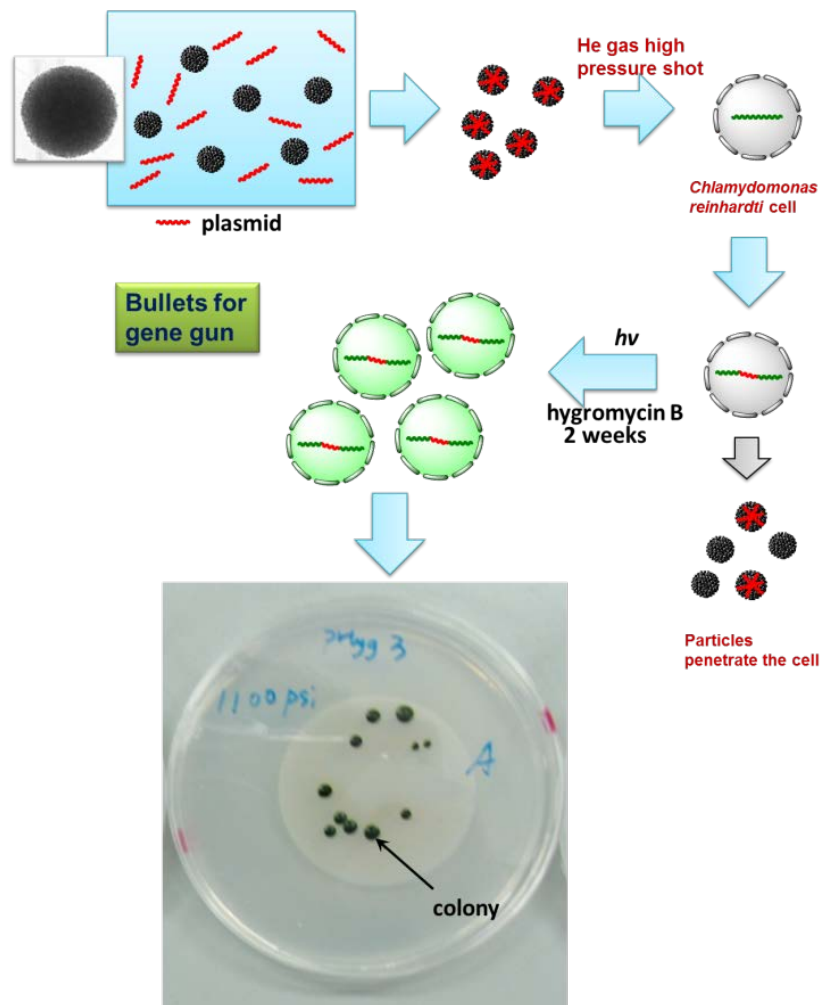
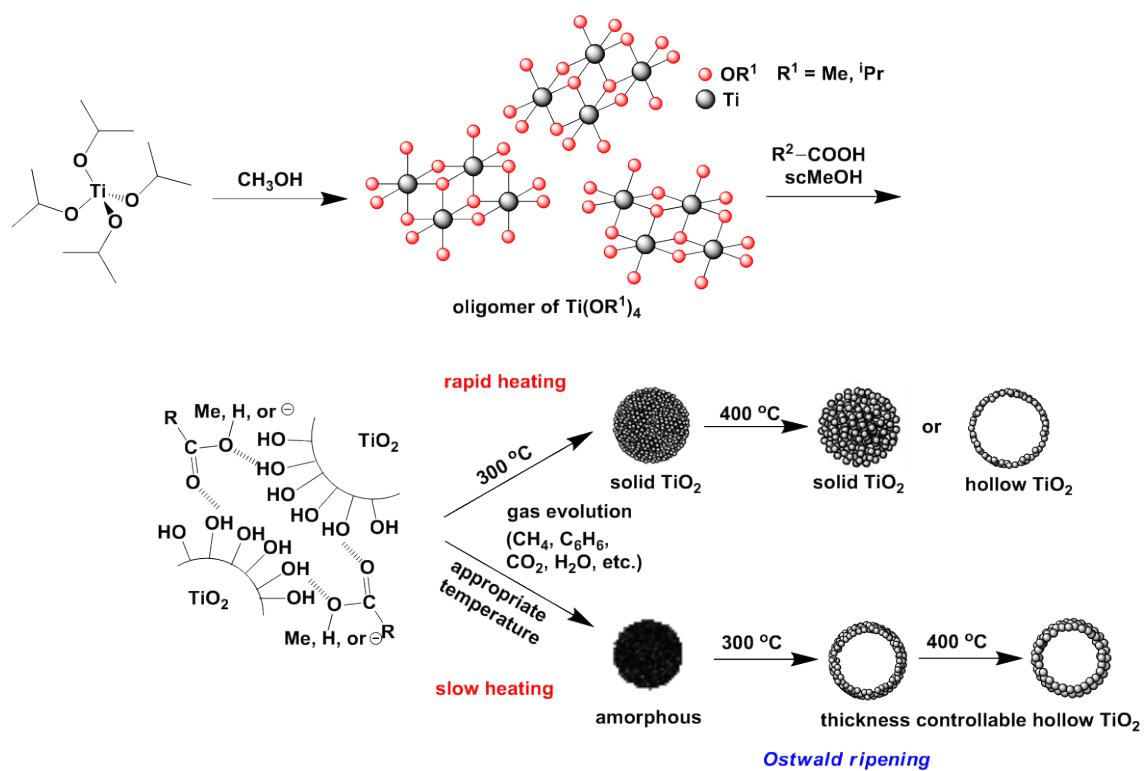


Fig. 8. DNA transport under biolistic bombardment using MARIMO TiO₂ nanoparticles as bullets for the gene gun.



Scheme 1. Plausible mechanism for the formation of solid and hollow spherical mesoporous TiO_2 nanoparticles in scMeOH.