

## Exploring the catalytic activity of Nb<sub>4</sub>C<sub>3</sub>T<sub>x</sub> MXene towards degradation of nitro compounds and organic dyes by *in situ* decoration of palladium nanoparticles

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### Supporting Information

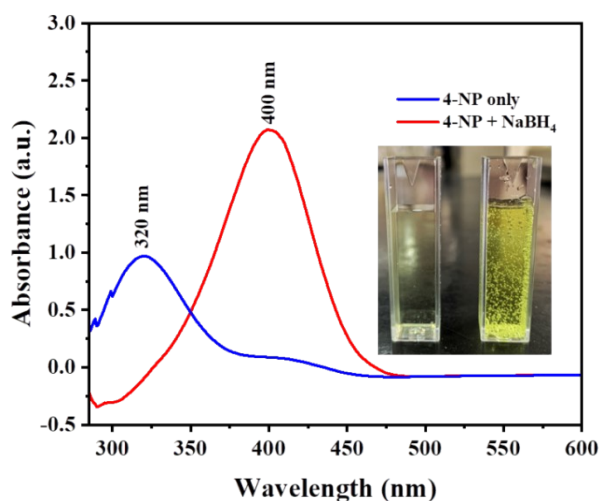


Fig. S1. The UV-Vis spectrum of the solution containing 4-NP and after the addition of NaBH<sub>4</sub>.

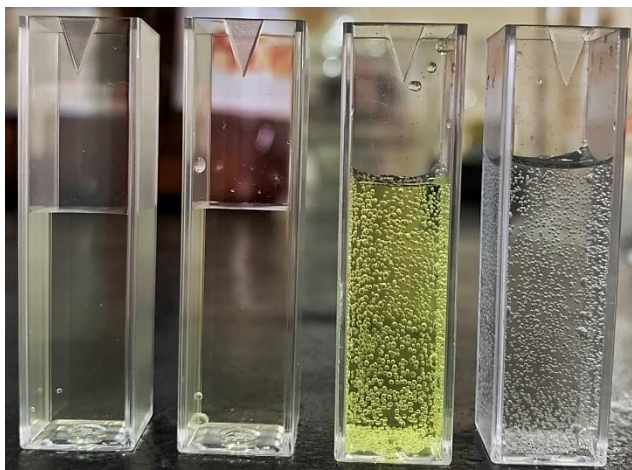
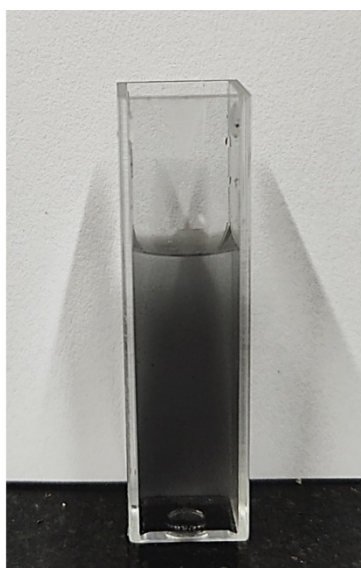
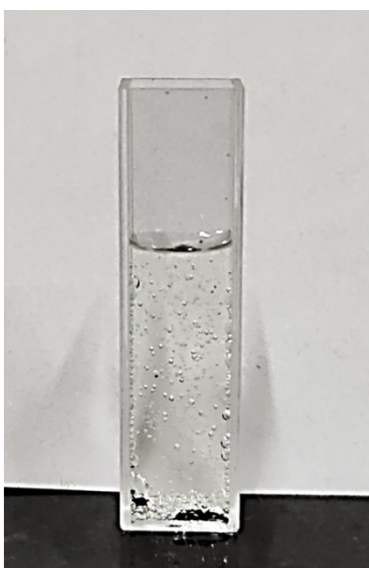


Fig. S2. The color change, which occurred during each step of the reaction. The first, second, and third photograph show the initial 4-NP solution, solution after adding the catalyst, and after adding  $\text{NaBH}_4$ , respectively. The last photograph shows the complete catalytic reduction (disappearance of color) after 3 min.



PdNPs before reaction



PdNPs after reaction

Fig. S3. The photographs of the PdNPs solution before and after the catalytic reaction

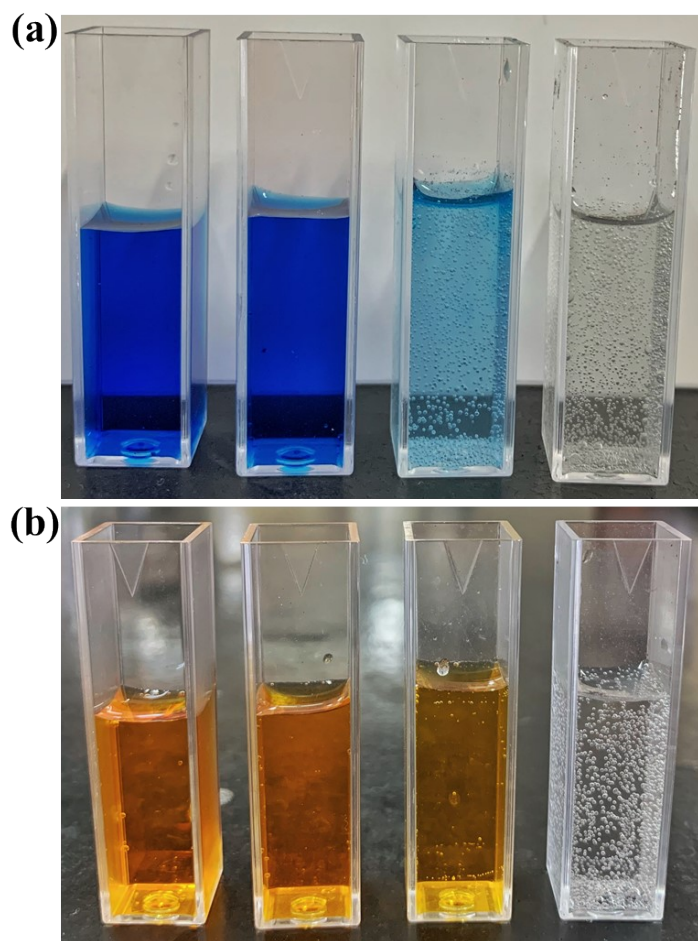


Fig. S4. The colour change, which occurred during each step of the reaction. First photograph in each panel shows the initial MB or MO solutions. Second photograph is after adding the catalyst and third photograph is after adding  $\text{NaBH}_4$ . The last photograph in each panel shows the complete catalytic reduction (disappearance of colour) after 3 min.