

Supplementary Information:

FTIR analysis of fresh and used Catalyst

The samples were characterized using FTIR spectroscopy before and after catalytic reduction of 4-NP to 4-AP. The catalysts subjected to the recyclability test (GAC) was collected by centrifugation with distilled water and dried at 50 °C in vacuum. After drying, the catalyst was made into a pellet using KBr and the spectra is shown in Figure S1. On comparison, no significant changes in the FTIR spectra was observed for the catalyst before and after reaction indicating the stability of the catalyst. A broad peak at 3520 cm^{-1} (O-H stretching vibration) and at 1620 cm^{-1} (H-O-H bending vibration) corresponding to moisture absorbed from the surrounding and Ce-O-Ce and Ce-O vibration are obtained around 1381 cm^{-1} and 575 cm^{-1} respectively.

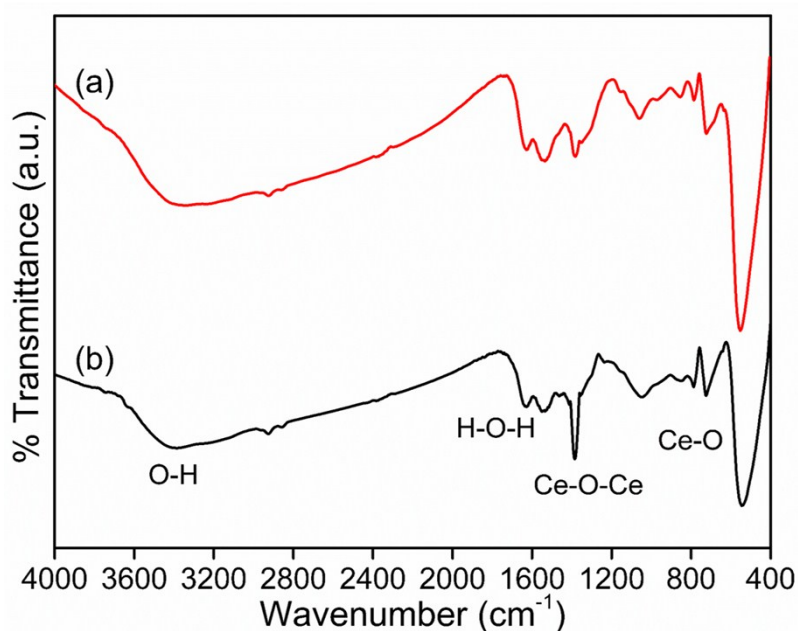


Fig. S1 FTIR spectra of the catalyst GAC before reaction (a) and spectra obtained for the catalyst subjected to recyclability test (b). No significant change in the FTIR spectra of the catalyst was observed before and after reduction of 4-NP to 4-AP indicating the stable nature of the catalyst GAC.