Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information

for

Sinter-resistant catalyst using the alumina support recycled from AlP fumigation residue: trash to treasure

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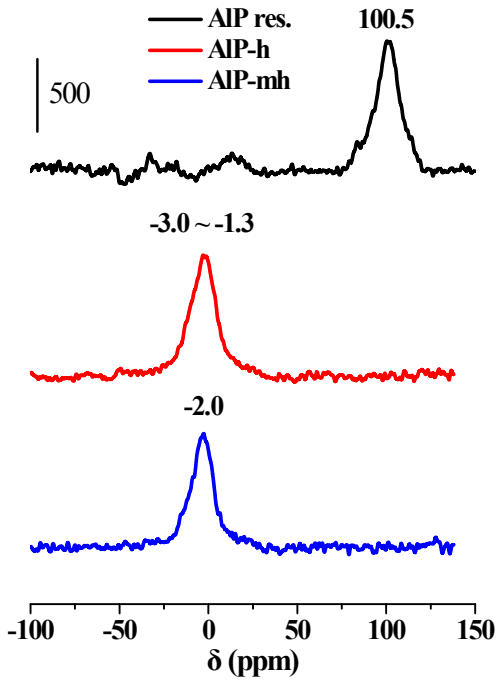

Fig. S1 ^{31}P NMR spectra of the samples treated with different conditions. 100.5 ppm was assigned to the chemical shift of P in AlP species, 2~ -5 ppm was assigned to the local structure of P in phosphate, which is similar to that in phosphoric acid.

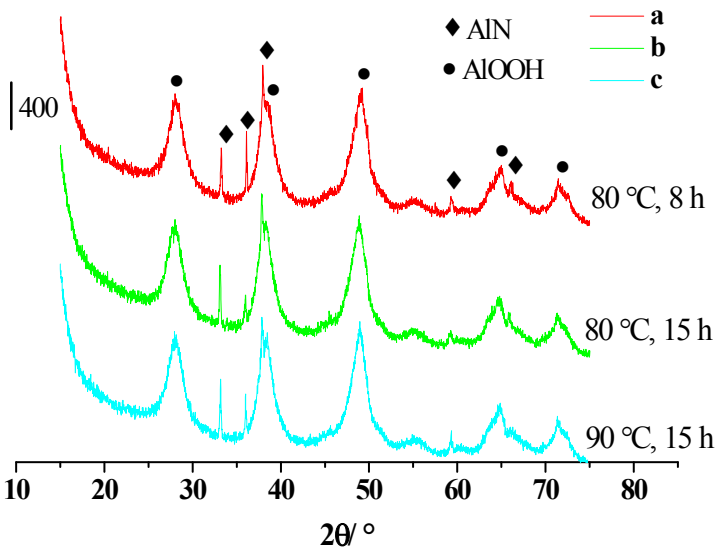

Fig. S2 XRD patterns of the hydrolyzed samples (AlP-h) at different treatment conditions. a, 80 ºC for 8 h; b, 80 ºC for 15 h; c, 90 ºC for 15 h. The AlN species could not be completely removed under all the hydrolysis treated conditions.

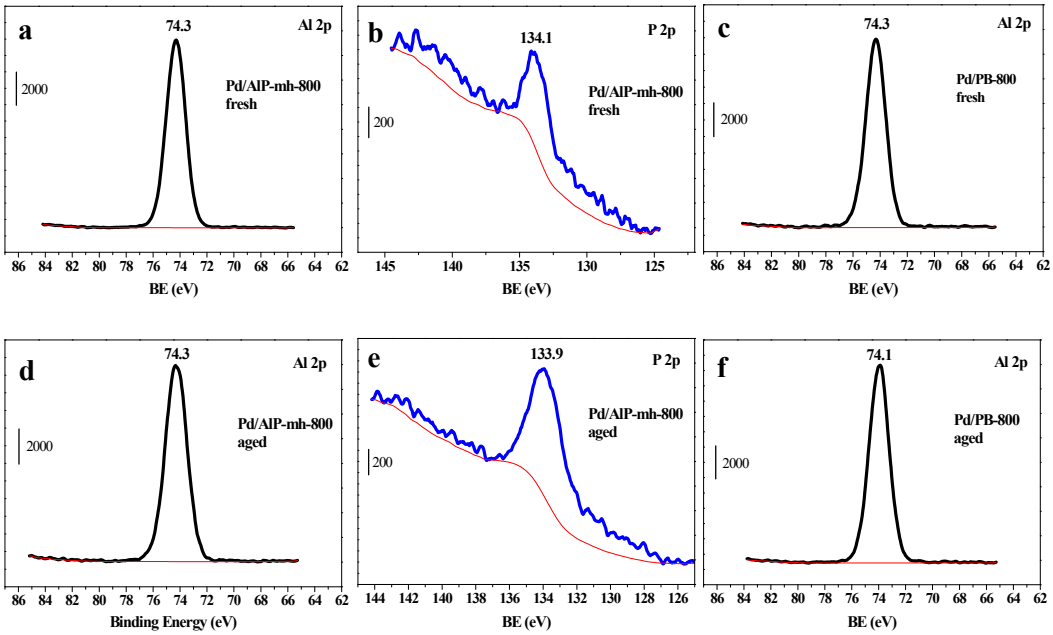

Fig. S3 Al 2p and P 2p XPS spectra of the (a, b and c) fresh and (d, e and f) aged catalysts.

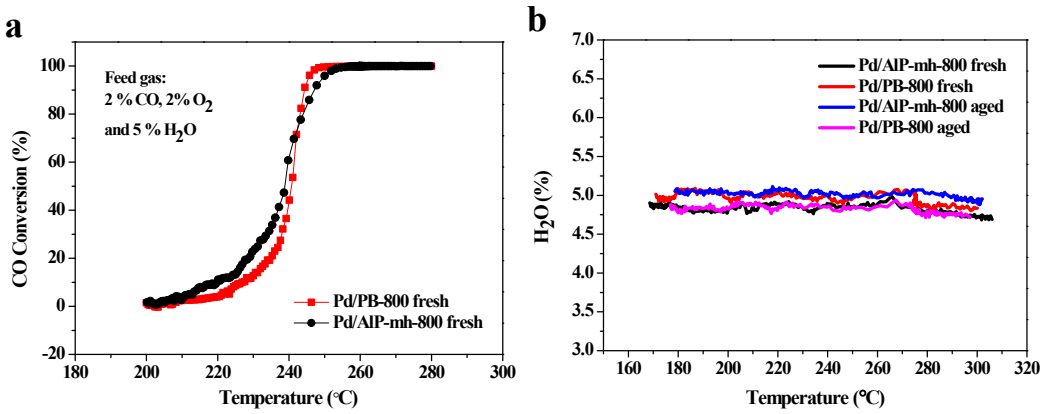

Fig. S4 (a) Activity tests of the fresh Pd/AlP-mh-800 and Pd/PB-800 catalysts. Feed gas stream: 2 % CO, 2 % O_2 and 5 % H_2O balanced with N_2 (flow rate: 1 L/min, 100 mg catalyst). The catalysts were reduced in 5 % H_2/N_2 at 200 ºC for 30 min before tests. (b) The changes of H_2O content during activity tests for both the fresh and aged catalysts.

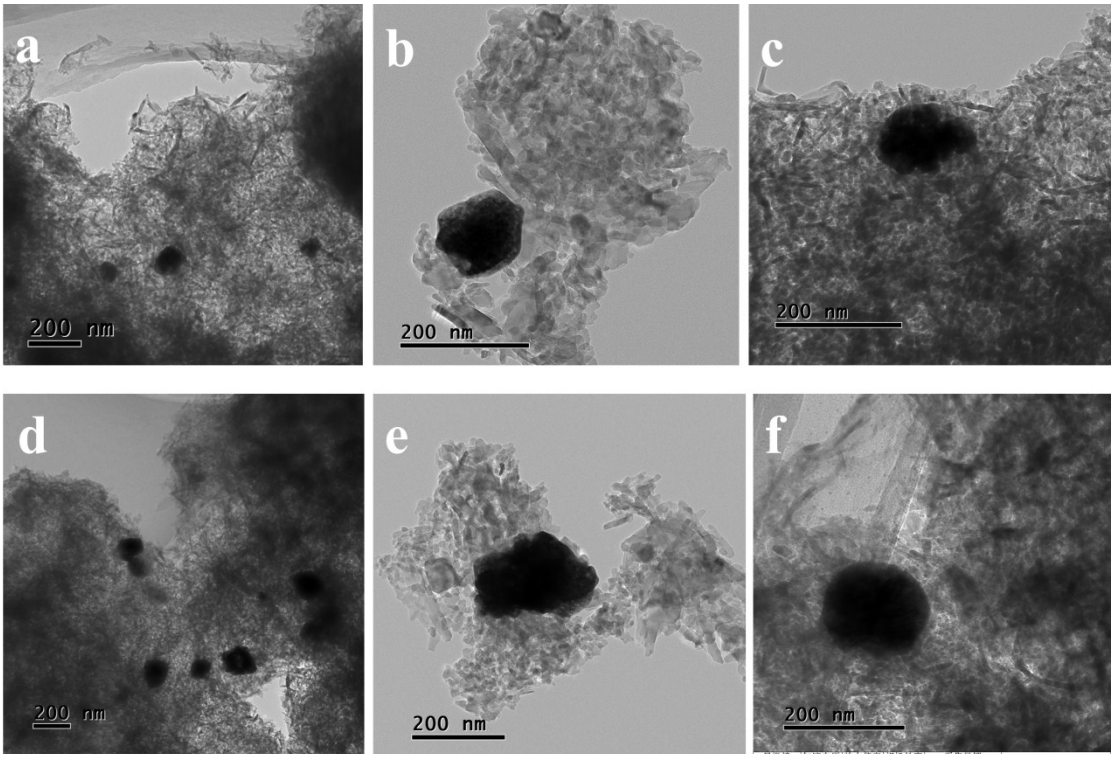

Fig. S5 Representative TEM images of the aged catalysts after H_2 reduction. a, b and c, Aged Pd/AlP-mh-800. d, e and f, Aged Pd/PB-800.