Catalysis Science & Technology

Significant effect of base on the selectivity improvement in the hydrogenation of benzoic acid over NiZrB amorphous alloy supported on γ–Al_2O_3

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Electronic Supplementary Information (ESI)

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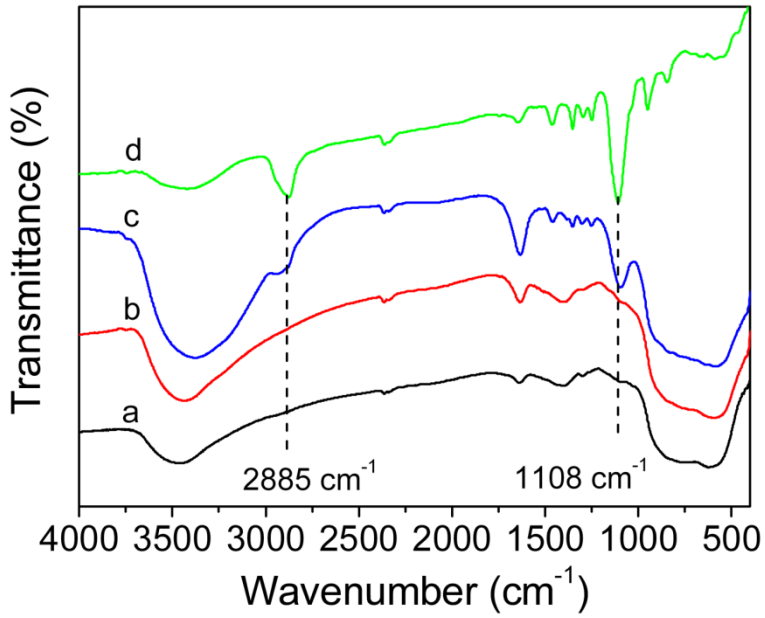


Fig. S1 FTIR patterns of (a) NiZrB/Al_2O_3, (b) NiZrB/Al_2O_3 (without PEG(800)), (c) precursor of NiZrB/Al_2O_3, and (d) PEG(800).

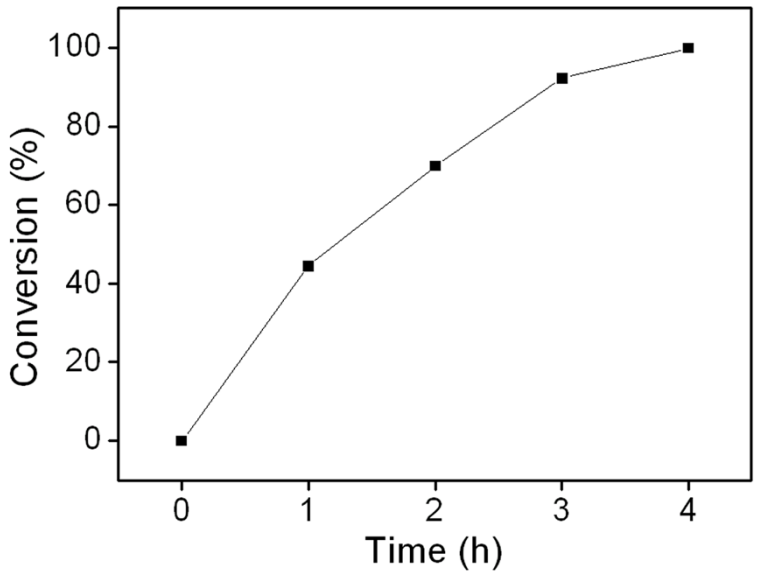


Fig. S2 Time-conversion plot of hydrogenation of BA. Reaction conditions: BA (3.0 g), cyclohexane (60 mL), NiZrB/Al_2O_3 (1.0 g, 11.0 wt % of Ni), K_2CO_3 (5 mol % of BA), 423 K, initial *P* (H_2) = 5 MPa.

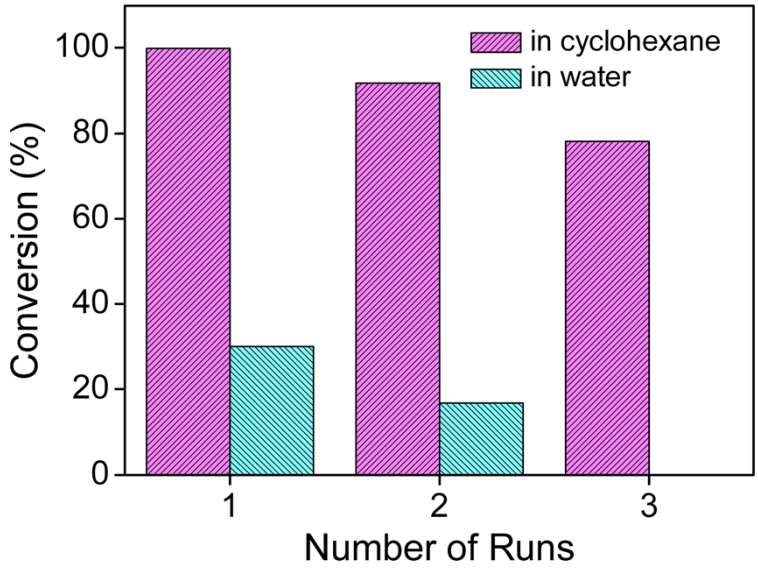


Fig. S3 Recycle runs of catalyst in cyclohexane and water. Reaction conditions: BA (3.0 g), cyclohexane (60 mL), NiZrB/Al_2O_3 (1.0 g, 11.0 wt % of Ni), K_2CO_3 (5 mol % of BA), 423 K, initial *P* (H_2) = 5 MPa and reaction time 4 h.

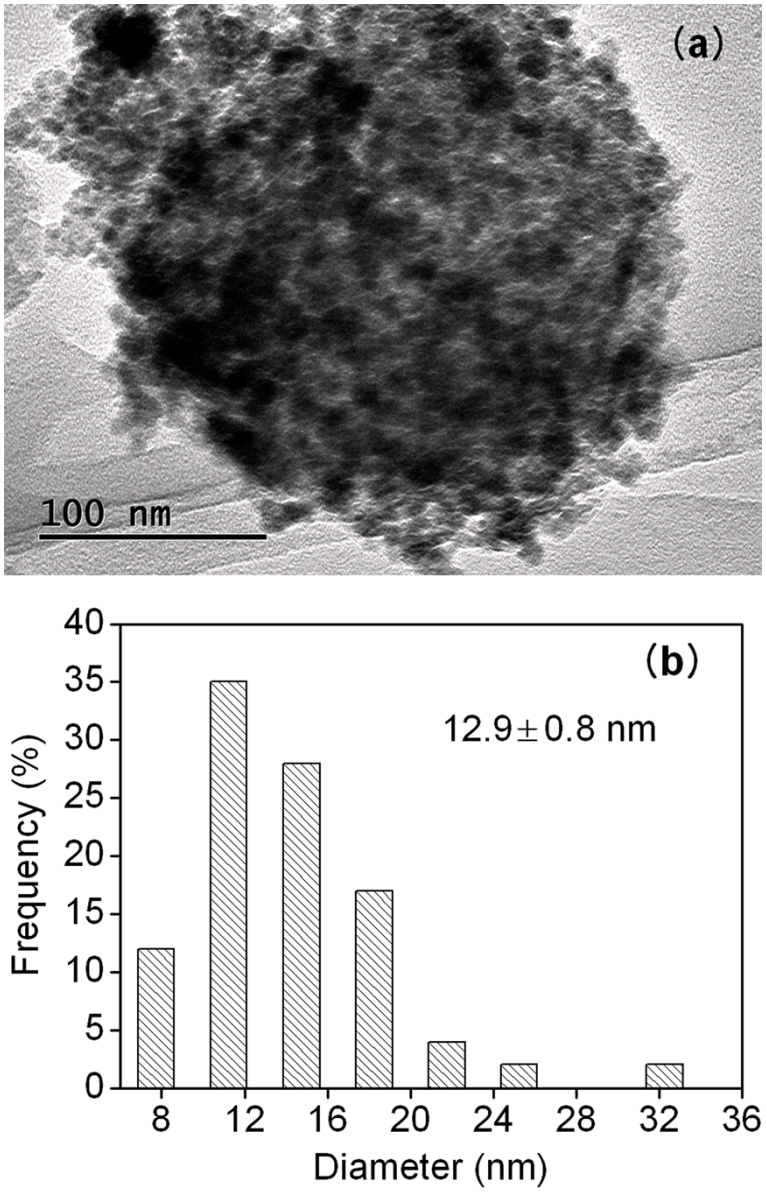


Fig. S4 TEM image (a) and size distribution (b) of NiZrB/Al_2O_3–u–K_2CO_3.

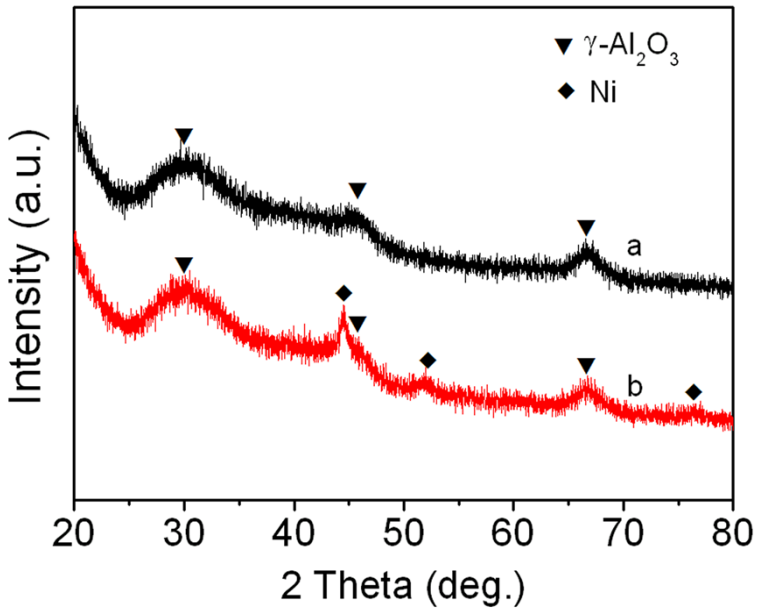
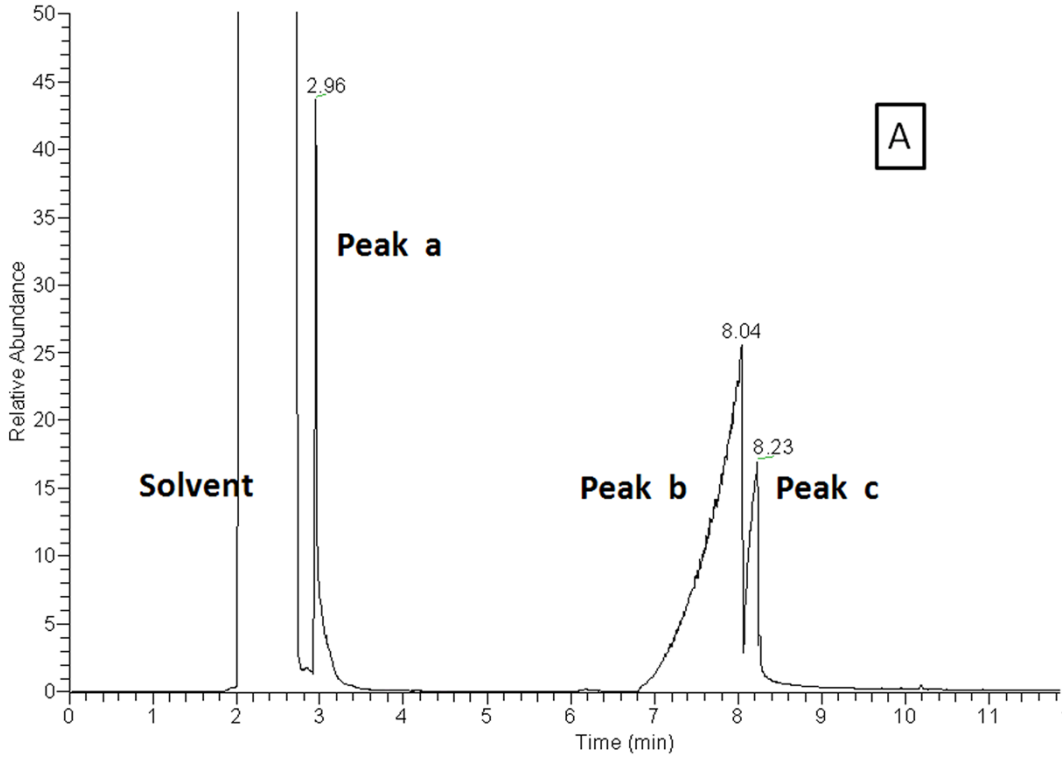
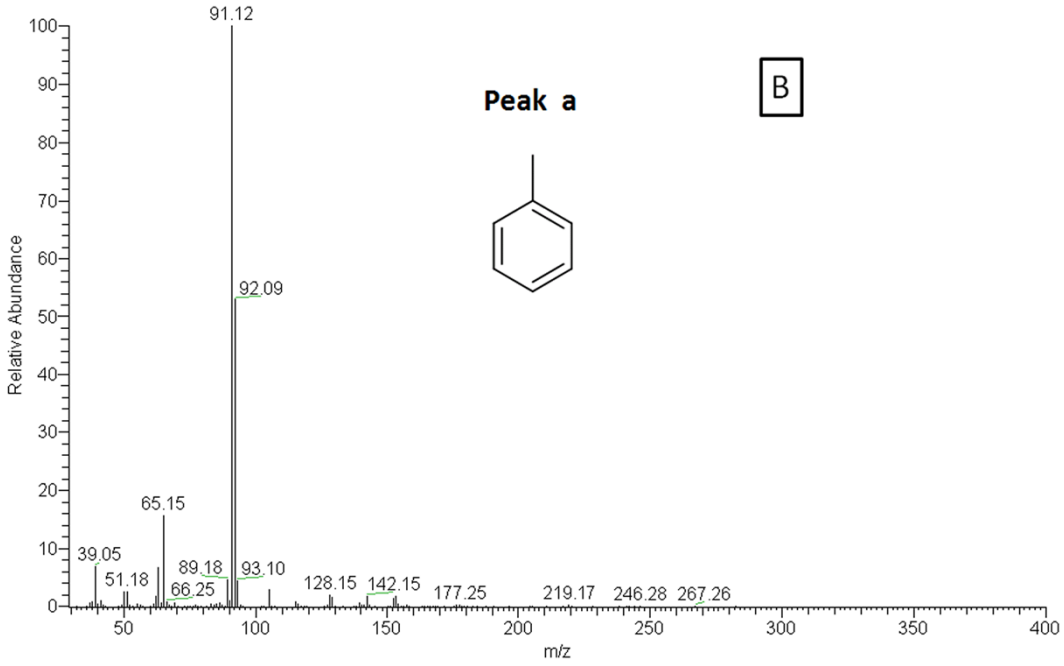


Fig. S5 XRD patterns of amorphous alloy catalysts. (a) NiZrB/Al_2O_3 and (b) NiZrB/Al_2O_3–u–K_2CO_3.


A
Relative Abundance
Time (min)
Solvent
Peak a
Peak b
Peak c
2.96
8.04
8.23


B
Peak a
Relative Abundance
m/z
91.12
92.09
65.15
39.05
51.18
89.18
66.25
93.10
128.15
142.15
177.25
219.17
246.28
267.26

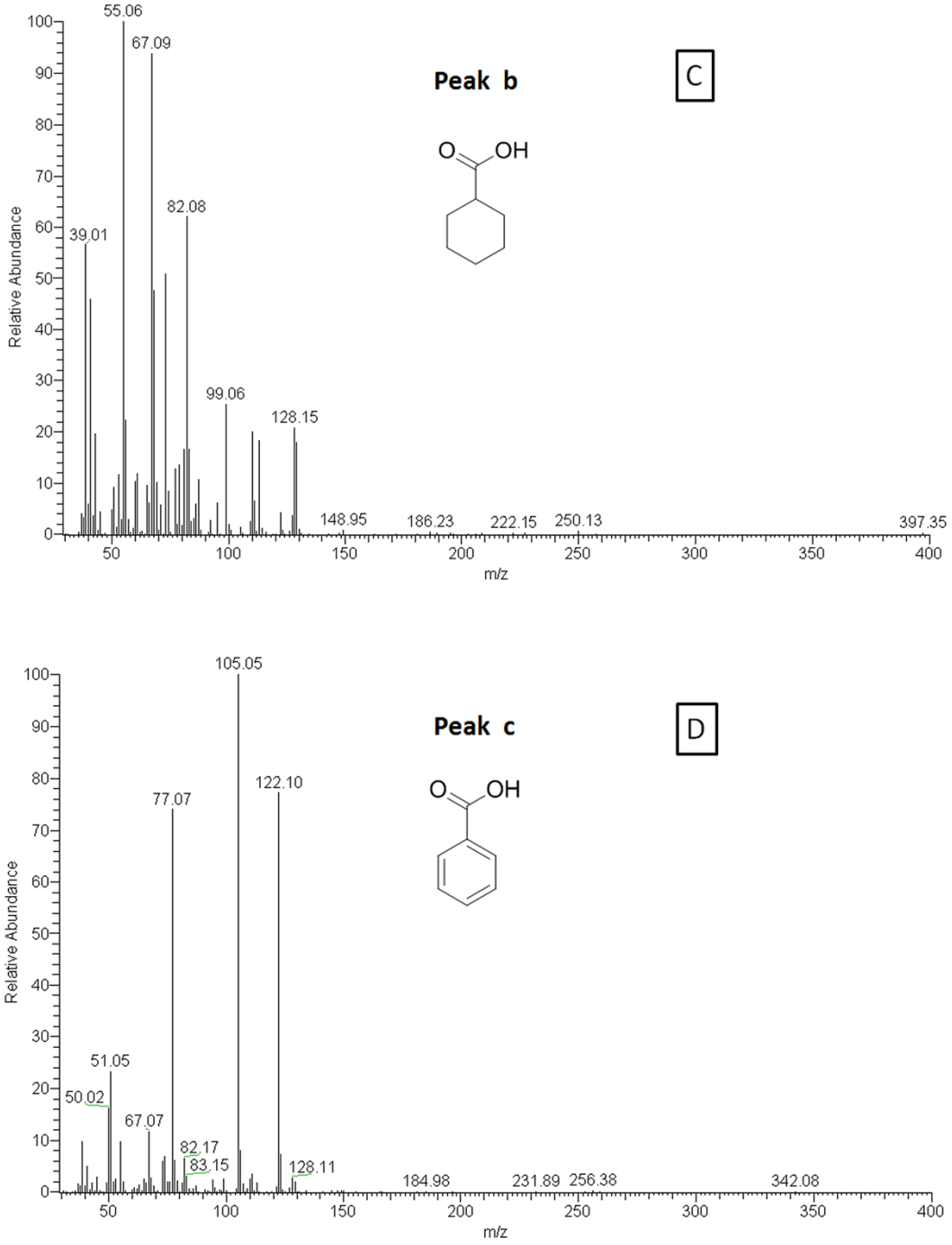


Fig. S6 GC-MS analysis of the hydrogenation products. (A) GC analysis, (B-D) the MS patterns of peak a, b, and c in GC analysis.