**Table S1.** Acidic properties over different catalysts (mmol Py g−1-cat)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **Total acidity** | **Lewis acid sites** | | | **Brønsted acid sites** | | | | | **Lewis/ Brønsted** | | |
| *W*L | *S*L | *Total*L | | *W*B | SB | *Total*B | Weak | | Strong | *Total* |
| **H-ZSM-5** | 2.329 | 0.130 | 0.115 | 0.245 | | 1.449 | 0.635 | 2.084 | 0.090 | | 0.181 | 0.118 |
| **H-IM-5** | 2.505 | 0.169 | 0.197 | 0.366 | | 1.446 | 0.693 | 2.139 | 0.117 | | 0.284 | 0.171 |
| **H-IM-5(DS)** | 2.483 | 0.407 | 0.358 | 0.765 | | 1.415 | 0.303 | 1.718 | 0.287 | | 1.182 | 0.445 |

*S*L and *S*B-Strong Lewis and Brønsted acid; *W*L and *W*B-Weak Lewis and Brønsted acid.

**Table S2.** Products distribution of benzene alkylation with methanol on H-ZSM-5, H-IM-5 and H-IM-5(DS).

|  |  |  |  |
| --- | --- | --- | --- |
| **Products distribution (wt %)** | H-ZSM-5 | H-IM-5 | H-IM-5(DS) |
| Benzene | 24.50 | 16.74 | 11.73 |
| Toluene | 33.62 | 35.41 | 28.44 |
| Ethylbenzene | 3.72 | 1.09 | 0.98 |
| Xylene | 25.59 | 31.75 | 34.72 |
| Methyl-ethylbenzene | 1.61 | 0.87 | 0.72 |
| Trimethylbenzene | 2.82 | 11.10 | 16.53 |
| Tetramethylbenzene | 0.23 | 1.49 | 3.05 |
| Others | 7.91 | 1.55 | 3.83 |



**Fig. S1.** X-ray diffraction patterns of the catalysts: (A) H-IM-5; (B) H-IM-5(DS); (C) H-ZSM-5.



**Fig. S2.** (A) N2 adsorption−desorption isotherms of H-IM-5 and H-IM-5(DS) samples and (B) the corresponding BJH pore size distributions derived from the adsorption isotherms.



**Fig. S3** The Py-IR spectrum over different catalysts: (A) H-ZSM-5, (B) H-IM-5, (C) H-IM-5(DS)



**Fig. S4.** NH3-TPD curves of samples: H-ZSM-5, H-IM-5 and H-IM-5(DS)