Supplementary material

Figure S1

The NO conversion of different ratio of binders with Fe-BEA for NH_3-SCR of NO was shown in Fig. S1. Note that the activity of 20 wt% Zr with Fe-BEA was higher than the other ratio of Zr binders obviously and the activity of 20 wt% Al with Fe-BEA was similar with the other ratio of Al binders.

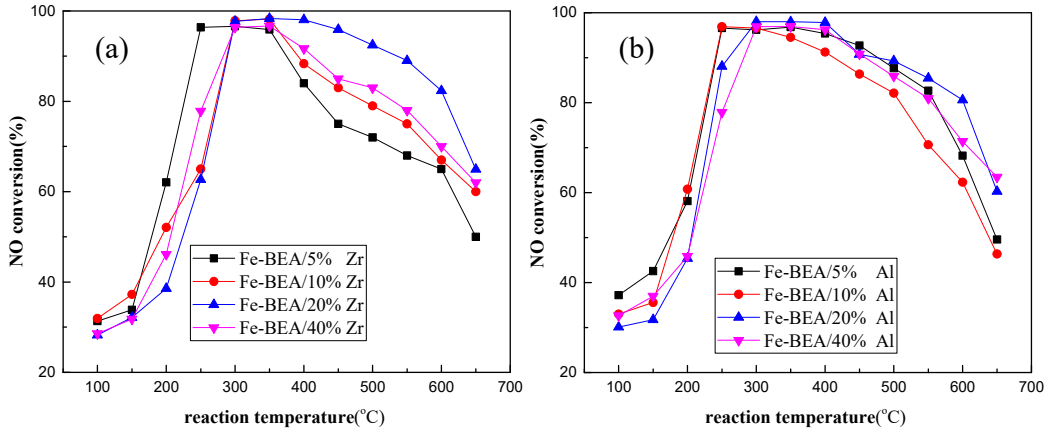

Fig. S1 NO conversion over Fe-BEA with different ratio of Zr (a) and Al (b) binders

Figure S2

The cordierites (5.5mm×5.5mm×5mm) were immersed in the suspension that was stirring in the beakers. The coated samples were labeled as Fe-BEA-C、Fe-BEA/Al-C and Fe-BEA/Zr-C respectively. Then they were dried at 110℃ for 2h and afterwards calcined at 700℃ for 2h. The wash-coated samples would repeat the above steps to ensure the masses raised by 15% of the original cordierites. The NO conversion of coating samples was shown in Fig. S2 that observed the catalytic performance of Fe-BEA as a washcoat on a cordierite monolith with or without binders. When AlOOH and $ZrO(NO_3)_2 \cdot xH_2O$ were added as binders to improve adherence, the NO conversion increased in the non-active and active temperature window. While the NO conversion of Fe-BEA/Zr coating was better than the Fe-BEA/Al coating.

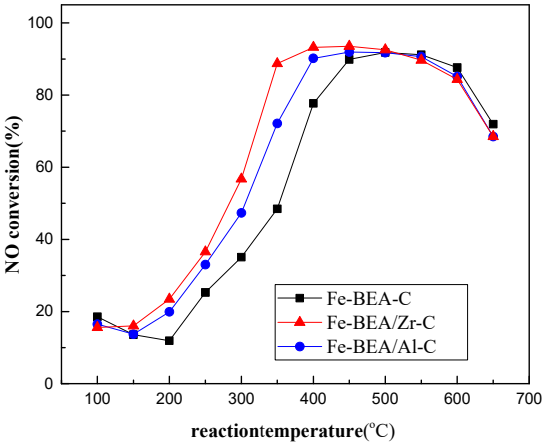

Fig. S2　NO conversion over coating catalysts

Figure S3

The pore distributions were shown in Fig. S3. The dominating pore radius of Fe-BEA, Zr and Al were 1.82 nm, 8.97 nm and 2.65 nm respectively. However, there were no pore radius of Zr and Al in the Fe-BEA+Zr and Fe-BEA+Al. Compared with the Fe-BEA, the number of micropores of radius ~1.8 nm increased in the mixed samples. These results suggested that adding different binders did not create new mesopores, but the micropores in the Fe-BEA samples were widened to a different extent. The surface area of the Fe-BEA+Al was the highest that might be the reason of the different surface area and pore volume of the binder Zr and Al.

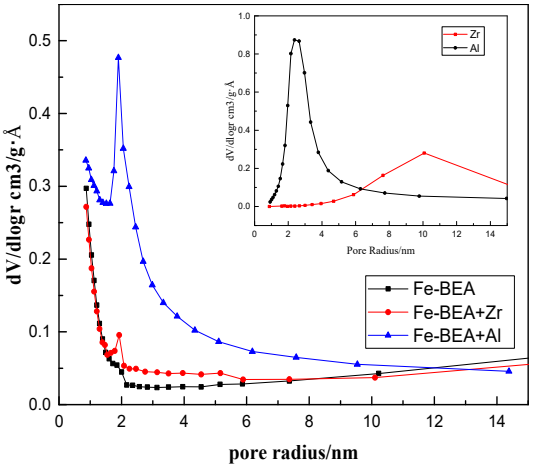

Fig. S3　Pore size distribution of powder catalysts