Supporting Information

**Fig. S1** The HAADF-STEM images and corresponding EDX elemental mapping images of the catalysts (a) MoAl(F) (b) MoAl(C)

**Fig. S2** The NH$_3$-TPD profile of the catalysts

**Fig. S3** The PXRD patterns of the spent catalysts

**Fig. S4** The (a) N$_2$ adsorption-desorption isotherms (Adsorption points are marked by filled symbols and desorption points by empty symbols) and (b) pore size distributions of the spent catalysts

**Fig. S5** The TG-DSC curves of the spent catalysts
Fig. S2 The NH$_3$-TPD profile of the catalysts
Fig. S3 The PXRD patterns of the spent catalysts
Fig. S4 The (a) $N_2$ adsorption-desorption isotherms (Adsorption points are marked by filled symbols and desorption points by empty symbols) and (b) pore size distributions of the spent catalysts.
Fig. S5 The TG-DSC curves of the spent catalysts