Supplementary Information

for

Synergistic reaction between SO$_2$ and NO$_2$ on mineral oxides: a potential formation pathway of sulfate aerosol

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Figure S1. *In situ* DRIFTS spectra for the reaction of 200 ppmv SO$_2$ and 200 ppmv NO$_2$ on (a) CaCO$_3$ and (b) CaSO$_4$ as a function of time in a flow of 100 mL min$^{-1}$ synthetic air (20% O$_2$, 80% N$_2$) at 303 K.
Figure S2. Dynamic changes in the *in situ* DRIFTS spectra of CaO sample as a function of time in a flow of 200 ppmv SO$_2$ + 200 ppmv NO$_2$ + 20% O$_2$ + 80% N$_2$ at 303 K. Total flow rate was 100 mL min$^{-1}$.

Figure S3. *In situ* DRIFTS spectra of 500 ppbv SO$_2$ and 500 ppbv NO$_2$ reaction in a flow of 100 mL min$^{-1}$ synthetic air (20% O$_2$, 80% N$_2$) on the surface of CaO as a function of time at 303 K.