Supplementary Information

for

Synergistic reaction between SO_2 and NO_2 on mineral oxides: a potential formation pathway of sulfate aerosol

Chang Liu, Qingxin Ma, Yongchun Liu, Jinzhu Ma, Hong He*

**Research Center for Eco-Environmental Science, Chinese Academy of Sciences, Beijing 100085, China*

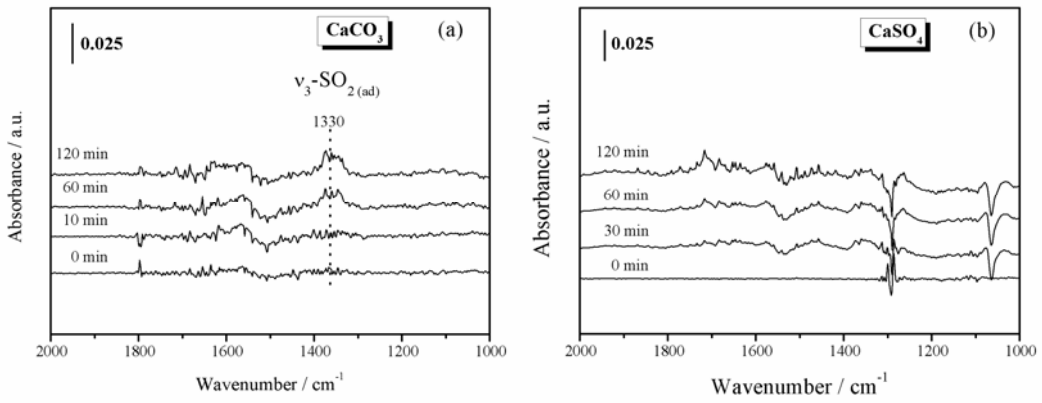

Figure S1. *In situ* DRIFTS spectra for the reaction of 200 ppmv SO_2 and 200 ppmv NO_2 on (a) $CaCO_3$ and (b) $CaSO_4$ as a function of time in a flow of 100 mL min^{-1} synthetic air (20% O_2, 80% N_2) at 303 K.

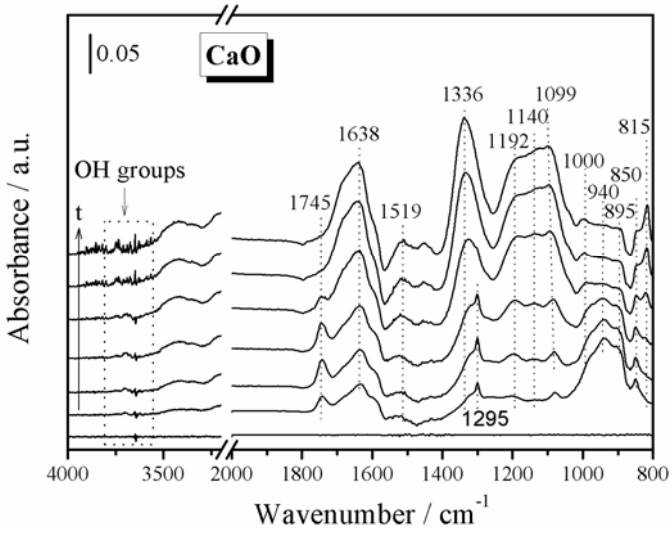

Figure S2. Dynamic changes in the *in situ* DRIFTS spectra of CaO sample as a function of time in a flow of 200 ppmv SO_2 + 200 ppmv NO_2 + 20% O_2 + 80% N_2 at 303 K. Total flow rate was 100 mL min^{-1}.

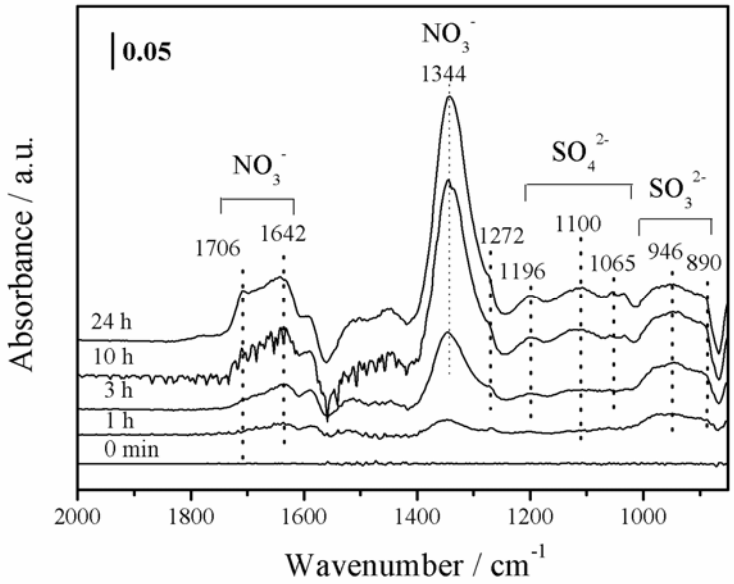

Figure S3. *In situ* DRIFTS spectra of 500 ppbv SO_2 and 500 ppbv NO_2 reaction in a flow of 100 mL min^{-1} synthetic air (20% O_2, 80% N_2) on the surface of CaO as a function of time at 303 K.