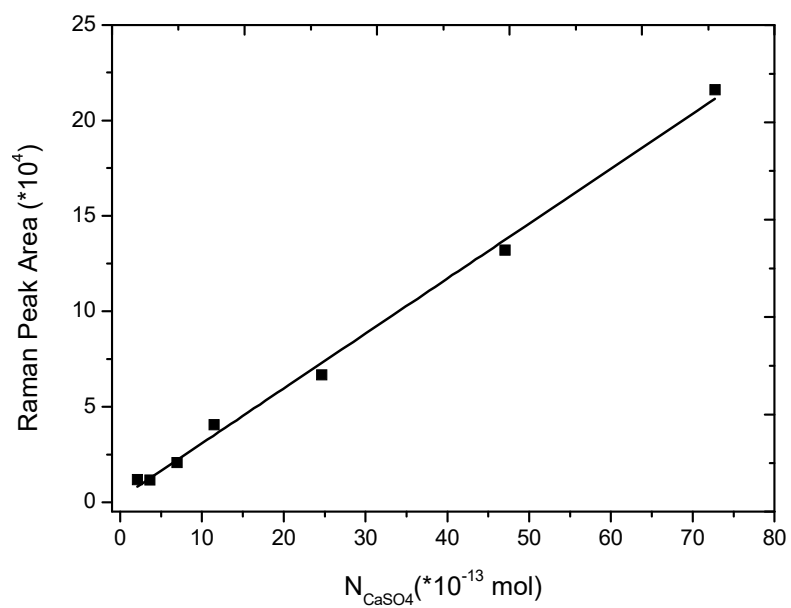
Supplement of
Multiphase Reaction of SO$_2$ with NO$_2$ on CaCO$_3$ Particles. 1. Oxidation of SO$_2$ by NO$_2$

Defeng Zhao[‡], Xiaojuan Song[‡], Tong Zhu*, Zefeng Zhang, Yingjun Liu

SKL-ESPC and BIC-ESAT, College of Environmental Sciences and Engineering, Peking University, Beijing, 100871, China

‡These authors contributed equally to this work.

Correspondence to: Tong Zhu (tzhu@pku.edu.cn)

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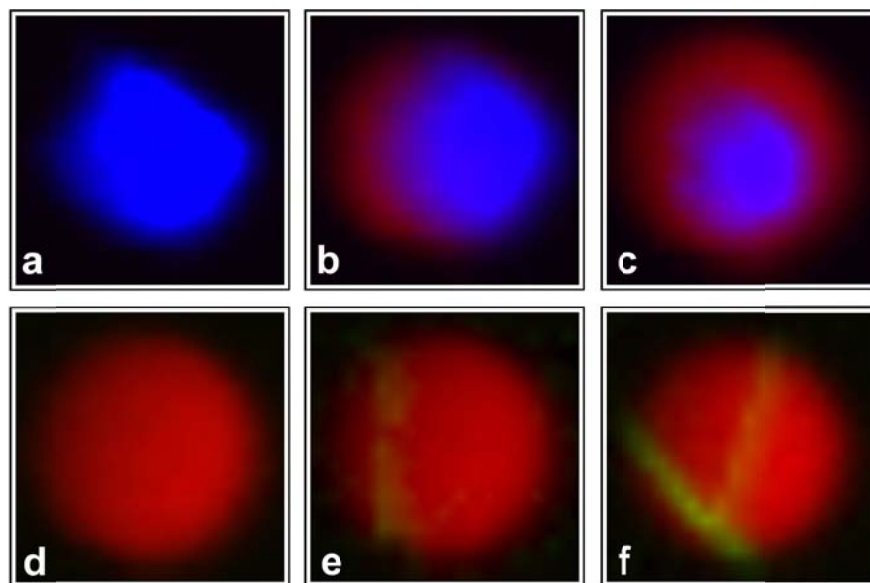
10 Figure S1. Calibration curve for sulfate showing the peak area of sulfate at 1016 cm^{-1} in Raman
11 spectra versus the amount of CaSO$_4$.

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13   Figure S2. Raman mapping analysis of a $CaCO_3$ particle during the reaction with NO_2 (75 ppm)

14   and SO_2 (75 ppm) at 72% RH at the reaction time of 0, 8, 26, 40, 97, and 1053 min. Blue, red,

15   and green indicate the Raman peak intensity of carbonate, nitrate, and sulfate at 1087, 1050, and

16   1013 cm^{-1}, respectively.