

## ***Interactive comment on “Evolution of aerosol chemistry in Xi’an, inland China during the dust storm period of 2013 – Part 1: Sources, chemical forms and formation mechanisms of nitrate and sulfate” by G. H. Wang et al.***

**Anonymous Referee #2**

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This study focused on aerosol chemistry in inland China and discuss the possible chemical mechanisms of nitrate and sulfate. The authors designed the research during one Asian dust storm. The hourly dust samples were collected to understand the chemical changes from early stage of dust storm to end. Through comparisons chemical compositions of different dust samples at different stages of dust storm and size-resolved aerosol sampling, the authors obtained the chemical forms and formation mechanisms of nitrate and sulfate. The study is good presentation for the research results. However, the paper need to be one minor revision.

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17441 L2 deleted in the current work./ Total suspended particulate (TSP) samples were L17, biomass burning emitted Cl<sup>-</sup>. The author should provide any evidence.

L12-21, the author need to consider why NH<sub>4</sub><sup>+</sup> and NO<sub>3</sub><sup>-</sup> were mixed with mineral dust particles in coarse mode instead of the externally mixed with dust particles although the good linear from NH<sub>4</sub><sup>+</sup> and NO<sub>3</sub><sup>-</sup>.

L23 CaSO<sub>4</sub> particles are minor hygroscopic materials. The Na<sub>2</sub>SO<sub>4</sub>, CaSO<sub>4</sub> and NaCl have high deliquescence relative humidity but during the dust period the relative humidity is quite low. My question is any evidence to prove these particles absorb water to form aqueous phase.

17444. L27, hygroscopic salts include NaCl, Na<sub>2</sub>SO<sub>4</sub> not CaSO<sub>4</sub>?. I am worried about the CaSO<sub>4</sub> here.

17448 L6, PM<sub>2.5</sub> mass concentration

17449 L17-19, sulfate concentration, ammonium concentration

17451 L4 NaCl- should be NaCl

17452, Na<sub>2</sub>SO<sub>4</sub> and CaSO<sub>4</sub>. Again my question is L23

17453, L25-26, need reference or evidence.

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