

## Comments on “The contribution of residential coal combustion to atmospheric PM<sub>2.5</sub> in the North China during winter”

The air pollution is very serious in China especially the North China during winter. Moreover, the rapid formation of PM<sub>2.5</sub> is more frequency, and the reason of this phenomenon is not very clearly. This article studied the concentration, composition, and the correlations of the key species of PM<sub>2.5</sub> in four sampling sites of North China. The study demonstrated that the residential coal combustion was dominant source of atmospheric OC, EC, Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup> and NH<sub>4</sub><sup>+</sup> in both rural areas and cities in the four sites of North China. The author also used the CMC method to calculate the contributions of the primary particle emission form residential coal combustion to PM<sub>2.5</sub> at the four sites during winter. The article is suitable to be published in this Journal. I recommended it to be accepted after minor revision.

Comments:

1. 361 line: The author demonstrated that the formation rate of SO<sub>4</sub><sup>2-</sup> via heterogeneous or multiphase reactions might be slower, so the correlation between OC (or EC) and SO<sub>4</sub><sup>2-</sup> was insignificant. This conclusion is not convinced. The author should give more evidence to support this point, such as some analyzing of trace gases (SO<sub>2</sub>, CO, NO<sub>x</sub> and so on) during the period in four sites or reference some laboratory studies on the formation rate of SO<sub>4</sub><sup>2-</sup> via heterogeneous or multiphase reactions.
2. There are some grammar error, the author should improve the English of the article.