

***Interactive comment on “Elevated nitrogen-containing particles observed in Asian dust aerosol samples collected at the marine boundary layer of the Bohai Sea and the Yellow Sea” by H. Geng et al.***

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The manuscript ACP-2009-247 reports single particle observations and measurements on aerosol particles collected on ferryboat using SEM-EDX method. It provides a good opportunity to see the difference between aerosol samples collected in marine boundary layer and those from terrestrial locations. Quite a few particles were collected as droplets in this study, for instance those notated as ‘droplet particles rich in C, N, O’

C2864

featured by a dark shade with circular shape in SEI (secondary electron Image). One can imagine when the droplet was collected it splashed over on the sampling substrate as a liquid layer and dried out afterwards. ‘Droplet particles rich in C, N, O’ were regarded as a mixture of organic matter with  $\text{NH}_4\text{NO}_3$  and often with minor Na, Mg from sea water. Similarly, it would be also possible that sea salt particles were collected as either particles or droplets. The author discussed two processes that may generate sea salt particles, bubble bursting and sea spray (page 13663, line 17), the former tends to form small droplets that finally lead to fine sea salt particles, whereas the later tends to form big droplets and convert into coarse sea salt particles eventually. In Figure 4 we could find some sea salt particles with typical cubic shape of sea salt, for example particles 23, 67, 71. It was notated as reacted sea salt; however, the crystalline shape is well preserved. We may propose that those particles were most likely collected as a single particle. On the other hand, particles 6, 8, 10 in Figure 4 appear as a group of particles scattered over a circular pattern. It was possible that those particles were collected as a fresh droplet from sea spray, splashing over and drying out as a cluster of genuine sea salt particles. Moreover, particles 2, 18, 64, 59, 61 have similar appearance in Figure 4, but notated as reacted sea salt. So their situation could be more complicated, those droplets may have experienced longer airborne periods and some atmospheric reactions. It seems the aerosol samples of Marine Boundary Layer were featured by the fact that a substantial portion of particles were actually collected as droplets.

On page 13674, line 25-27, it was said ‘The results imply that Asian dust aerosols were an important carrier of gaseous inorganic nitrogen-containing particles (within 1.0-10  $\mu\text{m}$ ). ...’ It might be better to say ‘The results imply that Asian dust aerosols were an important carrier of gaseous inorganic nitrogen-containing species, especially  $\text{NO}_x$  (or  $\text{HNO}_3$ ) and  $\text{NH}_3$ . ...’

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C2865