03 November 2025

Dear Professor Guangjie Zheng,

Thank you very much for handling our manuscript submitted to ACP for the consideration of publication (manuscript number: egusphere-2025-2235; title: Atmospheric chemical processing dictates aerosol aluminum solubility: insights from field measurement at two locations in northern China).

The third version of our manuscript has been reviewed by two referees again. One referee has no further comments, and the other referee only has a minor comment on our abstract. We have addressed this comment and revised our abstract accordingly, and believe that the revised manuscript can be accepted for publication

We would like to take this opportunity to thank you and the two referees for all your very valuable inputs. Please feel free to contact us if you need further information.

Dr. Mingjin Tang, Professor
Guangzhou Institute of Geochemistry
Chinese Academy of Sciences
Guangzhou 510640, China

Comments by referees are in blue.
Our replies are in black.
Changes to the manuscript are highlighted in red both here and in the revised manuscript.

Reply to referee #2

This manuscript investigates seasonal and size-resolved fluctuations in aerosol aluminum (Al) solubility at two sites in northern China, inland Xi'an and coastal Qingdao. I would suggest adding numerical statements in the abstract. The current version lacks statistical comparison and provided only text statements. Specifically, lines 36-37: "substantially aged" and "leading to significant enhancement in aerosol Al solubility". The authors should add numbers to support their conclusions.

Reply: We would like to thank referee #1 for reviewing our manuscript and recommending it final publication after minor revision to the abstract.

As suggested, in the revised manuscript (page 2) we have made the following changes to provide numerical information for aerosol Al solubility at the two locations: "Aerosol Al solubility was very low at Xi'an (0.11-9.1%), showed no apparent variation with seasons or relative humidity, and was not correlated with sulfate or nitrate; in contrast, it was much higher at Qingdao (0.06-23.4%), exhibited distinct seasonal variability, and increased with relative humidity and the abundance of sulfate and nitrate."

In addition, we have deleted some words in the abstract in order to keep the number of words below 250. Please kindly refer to the revised manuscript for more information.