This paper presents an evaluation of various methods for parameterization of spectra of cloud condensation nuclei based on in-situ measurements of aerosol activation properties obtained in North China. The paper is generally well-organized, except the following points should be considered during revision:

1) The authors stated in their conclusions that a new parameterization of CCN number concentrations were proposed in the paper, but it is not clearly described.

We appreciate the suggestion. This part has been revised as "Assuming externally mixed aerosols of ammonium sulfate and CCN-inactive substances, a new parameterization of CCN number concentration is proposed using bulk activation ratio based on the activated number concentration of ammonium sulfate. The prediction of CCN number concentration using ammonium sulfate-based bulk activation ratio is better than that of total aerosol number concentration-based bulk activation ratio."

2) In most part of the text, the term "concentrations" should be changed as "concentration".

We have made corresponding corrections. Thank you.

3) In the title and many other places in the text, "aerosol activation property measurements" should be "measurements of aerosol activation property". Similar expressions are also found in other terms, such as "particle number size distribution". The authors should revise this kind of expression based on common English grammar.

The expression "aerosol activation property measurements" has been revised in the text.

4) Page 146, Line 9: Is "activation curves" different from "activation ratios"? Here, the latter may be more proper.

"Activation curves" has been revised as "size-resolved activation ratios" here.

5) Page 151, Line 1 and other places in the text: "formulas" should be "formulae".

"Formulas" has been revised as "formulae".

6) Page 154, Line 16-19: This sentence is not clear enough.

This sentence has been revised as "Probable explanation is that aerosols in accumulation mode include large particles irrelevant for aerosol activation at low supersaturations (e.g., particles with diameter of 120 nm at 0.061%) and might overlook small particles to be readily activated at high supersaturations (e.g., 80 nm particles at 0.812%)."

7) Page 170, the caption of Fig.3: The math expressions are wrong.

Thanks for your careful reading. We have corrected the caption of Fig. 3.

8) All the figure captions are not clear enough. For example, in most of the captions, the words, such as "their application of . . .. . .", are very ambiguous and confusion.

The ambiguous expressions have been revised.