

Response to Reviewer 1 Comments

1. Summary

Thank you very much for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

2. Questions for General Evaluation

Reviewer's Evaluation

Response and Revisions

Does the introduction provide sufficient background and include all relevant references?

Can be improved

The introduction section was improved by adding some more related reports.

Are all the cited references relevant to the research?

Must be improved

Additional articles that were pertinent to the study were cited to describe background information.

Is the research design appropriate?

Can be improved

We modified research design according to the reviewers' comments

Are the methods adequately described?

Can be improved

To improve the method section, detailed information was provided.

Are the results clearly presented?

Must be improved

Additional information was included to improve the results section.

Are the conclusions supported by the results?

Can be improved

The conclusion section was enhanced.

3. Point-by-point response to Comments and Suggestions for Authors

Comments 1: Regarding the silver species:

What is the oxidation state of the silver species supported on the molecular sieve? XPS?

Response 1: In our study, we employed AgNO_3 where an oxidation state of Ag is +1. We assume that the oxidation state of Ag on molecular sieve remains +1 on the samples.

Unfortunately, our department does not have X-ray photoelectron spectroscopy to assess the oxidation state of silver on samples.

Comments 2: Are the authors sure that only exchanged silver species exist? Why do the authors rule out the presence of segregated species?

Response 2: Agree. We presented analysis results of SEM-EDS technique for the samples. Furthermore, the AgNO₃ solution was solely employed to modify the 13X molecular sieve; no other substances were used. We also didn't understand what you meant by "segregated species."

Comments 3: The concentration of silver ions present in the adsorbents is not reported. The concentration shown by the SEM-EDS technique may be higher than the nominal one. I suggest determining the concentration of silver in the initial silver solution and the solution after the exchange. This procedure can be done with simple volumetric techniques because the silver concentration is high (0.02 M-0.1M).

Response 3: Agree. Because there is a limited time to resubmit the manuscript and we also have completed studies, we are concerned that we will be unable to continue the experiment and resubmit the manuscript on time. In the future, we will concentrate on determining the concentration of Ag ions present in the adsorbents, as proposed.

Comments 4: 10-30 wt.% are high concentrations of silver. The authors should critically compare the performance of the materials studied in this work with those reported in the literature.

Response 4: Agree. Despite the fact that some studies have been conducted on the modification of 13X with silver and other metals. Instead of natural gas, they used simulated gas containing N₂. To our knowledge, there is no silver modified 13X that has been used on the removal of H₂S, particularly from natural gas, we have limited ourselves to providing some details and giving some relevant reports.

Comments 5: The novelty of this work must be highlighted.

Response 5: Agree. We have highlighted the novelty of the work in the abstract and conclusion.