Fractal characteristics of shale pore structure and its influence on seepage flow

Shengwei Wang, Xijian Li, Haiteng Xue, Zhonghui Shen and Liuyu Chen

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Review timeline
Original submission: 17 December 2020
Revised submission: 17 April 2021
Final acceptance: 23 April 2021

Note: Reports are unedited and appear as submitted by the referee. The review history appears in chronological order.
Comments to the Author(s)
This is well written and interesting paper.

See comments below that will improve the readability and consistency of the paper.

domestic and foreign experts -> international research groups

Experimental -> Materials and Methods

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buried at a depth of approximately 2,500 m, that from Well Tianma
1 was buried at approximately 1,500 m, and that from Well Dafang
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location is shown in Figure 1.

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Table 1 X-ray diffraction analysis result of black shale /%.
-> what does /% mean. Please remove.
Also change result to results

Table 2 Porosity nuclear magnetic resonance (NMR) test results -> remove (NMR) from table2
caption

pore size distr
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BET specific surface area /$ (m^2/g) Average pore size /d (nm) Total pore volume per unit mass
(cm^3/)

remove /$ (i am guessing this is the symbol for specific area. If you want to define it, define it in
the text in ()
Remove /d .. same as above (cm^3/) -> (cm^3)

Table 4 Calculation results of pore fractal... -> Calculated pore fractal dimension for each sample.

where k is Boltzmann's constant, 1.38 × 10^-23 J/K; d0 is the gas molecule diameter, methane is
0.38 nm; T is the absolute temperature, K; and p is the gas pressure (MPa). -> please report the
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Please check equation 8, 9 etc for units to be reported in () instead of ,

In equation 10, units for C or DAeff are not given

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Previous studies divides the gas diffusion modes into: Kn > 10 indicates Knudsen diffusion; 0.1 <
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Decision letter (RSOS-202271.R0)

We hope you are keeping well at this difficult and unusual time. We continue to value your support of the journal in these challenging circumstances. If Royal Society Open Science can assist you at all, please don’t hesitate to let us know at the email address below.

Dear Dr Wang

On behalf of the Editors, we are pleased to inform you that your Manuscript RSOS-202271 "Fractal characteristics of shale pore structure and its influence on seepage flow" has been accepted for publication in Royal Society Open Science subject to minor revision in accordance with the referees’ reports. Please find the referees’ reports along with any feedback from the Editors below my signature. [There was only one referee for this paper, but their comments are sufficiently clear and positive that I believe it is fair to make a decision without seeking a second report.]

We invite you to respond to the comments and revise your manuscript. Below the referees’ and Editors’ comments (where applicable) we provide additional requirements. Final acceptance of your manuscript is dependent on these requirements being met. We provide guidance below to help you prepare your revision.

Please submit your revised manuscript and required files (see below) no later than 7 days from today’s (ie 15-Apr-2021) date. Note: the ScholarOne system will ‘lock’ if submission of the revision is attempted 7 or more days after the deadline. If you do not think you will be able to meet this deadline please contact the editorial office immediately.
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Thank you for submitting your manuscript to Royal Society Open Science and we look forward to receiving your revision. If you have any questions at all, please do not hesitate to get in touch.

Kind regards,
Royal Society Open Science Editorial Office
Royal Society Open Science
openscience@royalsociety.org

on behalf of Dr Philip Benson (Associate Editor) and Peter Haynes (Subject Editor)
openscience@royalsociety.org

Reviewer comments to Author:
Reviewer: 1

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Your revised paper should include the changes requested by the referees and Editors of your manuscript. You should provide two versions of this manuscript and both versions must be provided in an editable format:
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a 'clean' version of the new manuscript that incorporates the changes made, but does not highlight them. This version will be used for typesetting.
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Please ensure that you include a summary of your paper at Step 2 'Type, Title, & Abstract'. This should be no more than 100 words to explain to a non-scientific audience the key findings of your research. This will be included in a weekly highlights email circulated by the Royal Society press office to national UK, international, and scientific news outlets to promote your work.

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-- Your revised manuscript in editable file format (.doc, .docx, or .tex preferred). You should upload two versions:
  1) One version identifying all the changes that have been made (for instance, in coloured highlight, in bold text, or tracked changes);
  2) A 'clean' version of the new manuscript that incorporates the changes made, but does not highlight them.
-- An individual file of each figure (EPS or print-quality PDF preferred [either format should be produced directly from original creation package], or original software format).
-- An editable file of each table (.doc, .docx, .xls, .xlsx, or .csv).
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-- Any electronic supplementary material (ESM).
-- If you are requesting a discretionary waiver for the article processing charge, the waiver form must be included at this step.
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A copy of your point-by-point response to referees and Editors. This will expedite the preparation of your proof.

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-- If you are requesting an article processing charge waiver, you must select the relevant waiver option (if requesting a discretionary waiver, the form should have been uploaded at Step 3 'File upload' above).

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Author's Response to Decision Letter for (RSOS-202271.R0)

See Appendix A.

Decision letter (RSOS-202271.R1)

We hope you are keeping well at this difficult and unusual time. We continue to value your support of the journal in these challenging circumstances. If Royal Society Open Science can assist you at all, please don't hesitate to let us know at the email address below.

Dear Sir wang,

It is a pleasure to accept your manuscript entitled "Fractal characteristics of shale pore structure and its influence on seepage flow" in its current form for publication in Royal Society Open Science.

You can expect to receive a proof of your article in the near future. Please contact the editorial office (openscience@royalsociety.org) and the production office (openscience_proofs@royalsociety.org) to let us know if you are likely to be away from e-mail contact -- if you are going to be away, please nominate a co-author (if available) to manage the proofing process, and ensure they are copied into your email to the journal.

Due to rapid publication and an extremely tight schedule, if comments are not received, your paper may experience a delay in publication.
Please see the Royal Society Publishing guidance on how you may share your accepted author manuscript at https://royalsociety.org/journals/ethics-policies/media-embargo/. After publication, some additional ways to effectively promote your article can also be found here https://royalsociety.org/blog/2020/07/promoting-your-latest-paper-and-tracking-your-results/.

Thank you for your fine contribution. On behalf of the Editors of Royal Society Open Science, we look forward to your continued contributions to the Journal.

Best regards,
Lianne Parkhouse
Editorial Coordinator
Royal Society Open Science
openscience@royalsociety.org

on behalf of Dr Philip Benson (Associate Editor) and Peter Haynes (Subject Editor)
openscience@royalsociety.org

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Dear editor:

We have substantially revised our manuscript after reading the comments provided by the reviewers. We would like to thank the reviewers and the editor for the positive and constructive comments and suggestions. We employed an English-language editing service, Editage, to polish our wording. Certification is attached.

Answer to reviewers:

Comment 1: domestic and foreign experts -> international research groups
Response 1: We have fixed. See revised manuscript.

Comment 2: Experimental -> Materials and Methods:
Response 2: We have fixed. See revised manuscript.

Comment 3: was buried at a depth of approximately 2,500 m, that from Well Tianma 1 was buried at approximately 1,500 m, and that from Well Dafang 1 was buried at approximately 1,000 m. A map of the study area location is shown in Figure 1. Comment: we dont say "was buried at a depth" -> at a depth of ...
Response 3: We have fixed. See revised manuscript.

Comment 4: Table 1 X-ray diffraction analysis result of black shale/%. -> what does /% mean. Please remove. Also change result to results.
Response 4: We have fixed. See revised manuscript.

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Response 5: We have Removed (NMR). See revised manuscript.

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Response 8: We have fixed. See revised manuscript.

Appendix A

Manuscript revision instructions
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   Response 9: We have fixed. See revised manuscript.

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