September 7, 2016

Dear Editor,

Please find accompanying this letter our revised manuscript, “High pressure single crystal diffraction at PX^2” (JoVE54660\_R3) by myself (Dongzhou Zhang), Przemyslaw K. Dera, Peter J. Eng, Joanne E. Stubbs, Jin S. Zhang, Vitali B. Prakapenka and Mark L. Rivers, to be considered for publication in *Journal of Visualized Experiments*. We would like to thank the editor and the two reviewers for the very thorough and constructive comments, which helped to improve our manuscript. We have thoroughly addressed each of the editor’s questions and concerns in our revised manuscript. Please see our detailed responses (in bold) to the comments/questions (in italics) below.

Thank you for your attention to our work. Should you have any questions, please do not hesitate to contact me.

With Best Regards,

Dongzhou Zhang, on behalf of all co-authors

*Manuscript comments:*

*Editorial comments:*

*1. Grammar:*

*-Title – Please delete “at PX^2” from the title, which appears to be a project rather than a location.*

**Reply: We don’t agree with this comment. Though PX^2 is the name of a research project, it has a specific location (Experimental station 13-BM-C at the Advanced Photon Source). This experimental station has two research projects, and the other one is the surface diffraction program of the GeoSoilEnviroCARS, where people only do room pressure experiments. The two research projects have different funding sources.**

*-2.2 – Please correct the run-on sentence.*

**Reply: The run-on sentence has been corrected (Lines 208-210).**

*-2.8 - “Repeat the scan repeated twice”*

**Reply: We have corrected the typo (Line 245).**

*2. Additional detail is required:*

*-Please include all software used in the materials table. Please make sure all software mentioned in the protocol is open source or freely available. If not, the name of the software can only appear in the materials table and must be removed from the manuscript text.*

**Reply: We have added the software used in the materials table. Names of the commercial software have been removed from the manuscript text.**

*-2.10.2 – How is the detector arm moved? Is something specifically set in the software?*

**Reply: We have added details of this operation in the text (Lines 269-271).**

*-3.2 – Please clarify how one “creates these associations.”*

**Reply: We have added details of this operation in the text (Lines 302-304).**

*-3.5 – “difraction" typo*

**Reply: We have corrected the typo (Line 329).**

*3. Results: Please include a summary data table of the crystal structure or show a figure of the example crystal structure. Final results only appear to be listed in the text; they must be converted to a data table. Figures demonstrating software usage do not constitute representative results.*

**Reply: We have added one summary data table of the crystal structure to the manuscript.**

*4. Discussion: Please discuss the limitations of the protocol.*

**Reply: We have discussed the limitations of our protocol (Lines 465-469).**

*Reviewers' comments:*

*Reviewer #1:*

*Manuscript Summary:*

*It is gratifying to receive, for review, a manuscript so well written. It describes detailed procedures for carrying out single crystal X-ray diffraction experiments with DAC at the GSECARS 13-BM-C beamline at the APS. The techniques used are well described, and results are clearly discussed. Conclusions seem to be appropriate and sound. Moreover, a representative single crystal diffraction data from silicate mineral omphacite were also presented, which is very well done in this study with previous determinations.*

*Major Concerns:*

*N/A*

*Minor Concerns:*

*I wrote some few comments that the Authors may wish to consider.*

*1. "X-ray" and "x-ray" need to be unified;*

**Reply: All the terms have been unified.**

*2. The symbols of the lattice parameters should be italic;*

**Reply: We have italized all the symbols of the lattice parameters.**

*3. 325 line: should be "diffraction".*

**Reply: We have corrected the typo (Line 329).**

*Additional Comments to Authors:*

*N/A*

*Reviewer #2:*

*Manuscript Summary:*

*N/A*

*Major Concerns:*

*N/A*

*Minor Concerns:*

*The manuscript is clear and it is interesting that the authors decided to publish that topic on Jove. I have a a minor detail to underline, in the introduction, or, especially, in disussion line 443-450, authors should cite at least the following two reference papers describing similar procedures at other synchrotrons. I.e.*

*Single-crystal diffraction at the extreme conditions beamline P02. 2: procedure for collecting and analyzing high-pressure single-crystal data*

*A Rothkirch, GD Gatta, M Meyer, S Merkel, M Merlini, HP Liermann*

*(2013) Journal of synchrotron radiation 20 (5), 711-720*

*Single-crystal diffraction at megabar conditions by synchrotron radiation*

*M Merlini, M Hanfland*

*(2013) High Pressure Research 33 (3), 511-522*

**Reply: These two references have been added to the manuscript, in the Discussion session.**

*Additional Comments to Authors:*

*N/A*