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Interactive comment on “Pyrite Oxidation under initially neutral pH conditions and in the presence of *Acidithiobacillus ferrooxidans* and micromolar hydrogen peroxide” by Y. Ma and C. Lin

Anonymous Referee #3

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General comments The manuscript “Pyrite Oxidation under initially neutral pH conditions and in the presence of *Acidithiobacillus ferrooxidans* and micromolar hydrogen peroxide” submitted by Y. Man and C. Lin, is interesting in so far as the studies about this issue are relatively scarce. However, in my opinion, selected pyrite cubes are very large and the surface is low, which affects the results. Thus, the data obtained in the three experimental treatments did not show significant differences between them (Figures 1b, 3, and 4) and do not provide a clear scientific advance. Introduction: In page 559, line 22, the concentration range of H₂O₂ in natural environments should be included. A more intense explanation of the importance of the objective of the paper should also be included. Materials and methods Page 560, lines 12-13, given the im-

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portance of the pyrite cube size, the authors must explain the reasons that led them to select this size. Page 561, line 24, the time interval for re-injection of H₂O₂ should be justified. Page 562, line 13, should specify whether the cells counted were dead or alive. Discussion Page 566, lines 14-16, the sentence “The extract mechanism..... is not clear” should be revised. Page 567, lines 12-13, the authors suggest that “certain individual cells were able to adapt to high H₂O₂ conditions by developing H₂O₂ tolerance”, but could be that the survival of planktonic cells were due to the development of intrinsic resistance? Page 567, lines 25-27, the authors suggest that iron precipitates were formed, if so, the precipitates at the bottom of the culture flasks should be seen. Were such precipitates observed by the authors? In my opinion, more references are needed to support the discussion, especially Section 4.3. Conclusions In general, the scientific findings are not substantiated enough by the data.

Interactive comment on Biogeosciences Discuss., 9, 557, 2012.

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