

Reviewer 1:

Here my reply (in blue) to your questions. Changes are added in the manuscript

1.) p13742, line 12: it is the ratio of uptake rates of NH_4^+ and NO_3^- that is used to estimate new production, not their concentration ratio.

ANS: Corrected, changes added in the manuscript.

2.) p13743, line 15: this sentence is unclear

ANS: More detailed information on the hydrography of the fjord has been added.

3.) p13746, line 18: dilution of 61 mg?? units?

ANS: Yes, the final dilution measurements were made on mass units on a scale and then calculated back to volume.

4.) section 2.8, Table 2: are these full procedural blanks?

ANS: Yes, additional information on procedural blanks together with results on recovery tests of certified reference materials are now included.

5.) Figures 6 and 7: is it possible to assess the mass balance for Fe in the different mesocosms? This would help to address the concerns, that the authors themselves raise, about possible contamination.

ANS: Since we do not have any data on Total Fe, rather only measurements on Chelex labile Fe (both unfiltered, and filtered), it is not possible to assess the complete Fe pool in order to make a mass balance. We can only discuss how much existing iron which was not labile for Chelex-100 becomes Chelex labile being this iron basically uptake by phytoplankton. This is also indicates that previously non labile PFe have been converted to Chelex labile form through biological activity, which renders significant information.

6.) Section 4.1: the discussion here seems to be unduly empirical.

Uptake of NH_4^+ rather than NO_3^- reduces the Fe requirement for growth since no Fe is required for nitrate reductase. The observation that additions of NH_4^+ reduce the Fe:C ratio suggest a switch to NH_4^+ -fuelled growth with a consequently lower Fe requirement. It would be clearer to discuss the results using this Fe/N coupling as a starting point.

ANS: The Fe/N coupling would render indeed useful information, however the reason to carry out the discussion and analysis in terms of carbon and iron, is because among the primary objectives was to realize the changes in the distribution of Fe within the different fractions of phytoplankton produced by addition of different forms of Nitrogen, in order to obtain some information of probable changes of the Fe requirements and the iron quota Q.

7.) p13754, line 12: it is stated that NH_4^+ uptake at less energy expense leads to a lesser preference over NO_3^- . Surely the other way around?

ANS: Indeed, the intention is to say that under NH_4^+ surplus, it will be uptake preferentially as nitrogen source; consequentially phytoplankton will have lower Fe requirements. The section has been revised and changed.

8.) General points:

Some abbreviations such as LSL and $\mu\text{mol/L}$ are used without explanation.

ANS: LSL meaning is in page 13743 line 13. The Fe $\mu\text{mol/L}$ has been rearrange and presented in a clearer way in the section 3.4 page 13749 lines 20 to 24.

The English grammar should be corrected by a native speaker

ANS: Manuscript has been English reviewed