ID 5517

Title: **Applicability of zeolites in potassium and nitrate retention in different soil types**

**RESPONSE TO REVIEWERS**

Please notice that our responses are given in red lettering.

**Reviewer A:**

Does the manuscript contain enough significant original material?:

yes

Is the manuscript clearly and concisely written?:

no

Are the conclusions adequately supported by the data?:

yes

Does the manuscript give appropriate credit to related recent publications?:

yes

Are the references appropriate and free of important omissions?:

yes

Is the length of the manuscript appropriate?:

yes

Does the manuscript need condensation or extension?:

no

Is the quality of the figures (including legends and axes labelling) satisfactory?:

yes

Are the nomenclature and units in accordance with SI?:

yes

Are the English grammar and syntax satisfactory?:

yes

ADDITIONAL COMMENTS

The manuscript provides the results on the influence of addition of the natural zeolite - clinoptilolite (NZ) and its iron (III)-modified form (FeZ) on potassium and nitrate leaching from sandy, silty loam and silty clay soils. It is interesting paper, however need to be improved.

Specific comments:

Abstract:

Page 1, lines 22-24. The authors stated benefits of NZ as a good soil supplement for the K+ retention for all studied soils and in the NO3-N retention for silty loam and silty clay soils. The comment for FeZ is missed.

The text is now revised in accord to the reviewer comment.

Introduction

Introduction section is well written. Objectives are clear.

Materials and Methods

Subsection Materials

Page 2, line 65: Natural zeolitic tuff (NZ) was provided.... instead of „NZ was provided....“

The text is now revised in accord to the reviewer comment.

Page 3, line 67: „The chemical analysis of the clinoptilolite phase.....“ Question: Did the authors determined the chemical composition of clinoptilolite phase or of the raw material (NZ)?

Chemical composition of clinoptilolite phase is determined by the EDS/SEM analysis which is clearly stated at the page 3, line 67. This method enabled a quantitative chemical analysis of the clinoptilolite phase regarding Si/Al molar ratio which is in the range 4.5-5.5. This is now stressed in the text (page 3, lines 67-70).

Page 3, line 73: sentence „Modification of NZ was performed in accord with the previously published procedure.12“ should be changed into: „Modification of NZ was performed according to the procedure published by Habuda-Stanić et. al..12“

New reference should be added: M. Habuda-Stanić, B. Kalajdžić, M. Kuleš, N. Velić: ,Arsenite and arsenate sorption by hydrous ferric oxide/polymeric material, Desalination 229 (2008) 1–9.

The sentence is now rewritten and the suggested reference is added in the text.

Subsection Soil characterization

Page 3, lines 93-94: sentence: „Mineral identification was carried out according to Brown.14“ is not clear. Is this the method described by Brown and Brindley (ref 14)?

Mineral identification is now written more clearly.

Page 3, line 97: the authors stated: „Physicochemical properties of the soils were analyzed using standard procedures“. If this is the standard procedure, reference should be added.

New references are now added.

Page 4, line 101: Dumas method? The authors need to describe the method.

Dumas method is now described in the text.

Page 4, line 104: Egners Al-method? Is this the method published by Egner et.al? To describe.

Egners Al-method is published by Egner *et.al.* The method is now described in the text.

Subsection Leaching experiments

Page 4, lines 109-113: The authors described leaching experiments. Why the authors used 0.5% and 1% of the FeZ and only 1% of NZ?

In the Abstract (page 1, line 15) the authors stated: „The zeolites were added in two amounts: 0.5 and 1.0 wt.%.“

Since FeZ showed a better adsorption capacity towards potassium and nitrate than NZ used in similar amount (1 wt. %), FeZ was tested in a lower amount also.

Page 4, line 130: Why the leaching experiments were performed during the 7 days?

The leaching experiments were performed during 7 days in order to investigate the effect of zeolite (NZ and FeZ) addition on the leaching of potassium and nitrate through the heavy precipitation over a short period of time which is real phenomenon in some countries such as Norway.

Results and discussion

Subsection Soil properties

Page 7, line 178: illite (I)?

I is an usual abbreviation for illite.

Page 7, lines 181-183: How the authors determined the content of sand, clay and silt fraction in each soil?

The content of sand, clay and silt fraction in each soil type was determined by a semi-quantitative analysis i.e. by measuring the peak intensities calculated from the PXRD patterns and by comparing them to peak intensities of pure minerals. Explanation is now given in the experimental part (lines 98-99).

Page 7, lines 187-189: sentence: „The high OM and NTOT content are attributed to old cultivated grassland and pasture, and the high K content is connected to a much higher clay content in the BH than in the NW and SRB soils.“ is not clear.

The sentence is now rewritten to make it clearer.

Pages 7 and 8, lines 203-204: sentence: „For the NW soil (Fig. 2) the addition of 1 wt.% of NZ and FeZ (Systems III and VII, respectively) had a positive effect.“ is not clear.

The sentence is now corrected to make it clearer.

Page 10, lines 259-263: Sentences are not clear.

The text (lines 262-266) is rewritten.

In my opinion, this manuscript should:

be published after minor revision without additional review

If manuscript is suitable for publishing, referees recommendation:

Original scientific paper

**Reviewer B:**

Does the manuscript contain enough significant original material?:

yes

Is the manuscript clearly and concisely written?:

yes

Are the conclusions adequately supported by the data?:

yes

Does the manuscript give appropriate credit to related recent publications?:

yes

Are the references appropriate and free of important omissions?:

yes

Is the length of the manuscript appropriate?:

yes

Does the manuscript need condensation or extension?:

no

Is the quality of the figures (including legends and axes labelling) satisfactory?:

yes

Are the nomenclature and units in accordance with SI?:

yes

Are the English grammar and syntax satisfactory?:

yes

ADDITIONAL COMMENTS

1. Fig.1. It is necessary to explain the meaning of capital letters A, B,..., F, either in figure caption or in the text.

Тhe meaning of capital letters A, B,..., F is now explained in the Figure caption.

2. line 337: "пескуша, прашкаста иловача и прашкаста глина", should be replaced by: "пескушe, прашкастe иловачe и прашкастe глинe".

"пескуша, прашкаста иловача и прашкаста глина" is now replaced by "пескушe, прашкастe иловачe и прашкастe глинe".

REPORT:

The manuscript presents original work, valuable to be published in Journal of the Serbian Chemical Society. It can be published after minor corrections, without farther revision.

In my opinion, this manuscript should:

be published after minor revision without additional review

If manuscript is suitable for publishing, referees recommendation :

Original scientific paper