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Interactive comment on "Ion's association in soil and vadose zone of Azov-Black sea region" *by* A. A. Batukaev et al.

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The authors examine the possible interpretation of the properties of aqueous solutions in the soil and saturation zone on the theoretical base of chemical equilibrium in electrolyte. This is commendable. An opportunity opens not only to state the current situation in model or natural disperse systems under the influence of water, but also to better understand and quantitatively describe the dynamics of the system. The approach is useful for understanding geochemical processes in the soil and the vadose zone. This will help build a true use of soils and landscapes, to promote the well control of mass transfer, ensure geohygiene and soil health. There are comments. 1. The data of article reflect the properties of important, but only one component of dry steppe chestnut soil complex. It should be better to indicate the level of representativeness and meaningful of data and, particularly, the model, for the whole complex of chestnut

soils. In addition, geochemical processes are the sign not only of brown soil, but the vast majority of soils worldwide. In our opinion, the authors should assess the degree of universality of the developed approach to the description of the behavior of water systems in soils and vadose zone. 2. Most of the soils of the world are under the influence of anthropogenic factors of evolution. Besides, it is not just a factor, but the powerful driver of heavy deterioration of soil. Authors should indicate which new threats to the soil, vadose zone, the biosphere as a result of agriculture and other impacts on the environment can be discovered on the basis of developed simulation. Should also be shown the new ways to control soil and aeration zone, appeared in the focus of the research. After completion, which we offer not because of the fact that the article has some shortcomings, but mainly due to the possibilities of further development of approach, particularly in a view of our comments and suggestions, the article can be published.

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