

LOMONOSOV MOSCOW STATE UNIVERSITY  
SOIL SCIENCE FACULTY

Sokolova T. A.

SOIL ACIDITY AND THE ACID–BASE  
BUFFERING OF SOILS

The book is recommended by the Educational  
and Methodological Commission of the Faculty of Soil Science,  
Moscow State University,  
as a manual for students specialized in soil science 06.04.02



УНИВЕРСИТЕТ  
книжный дом

УДК 631.415.1  
ББК 40.3я7  
С59

*Reviewers:*

G. V. Motuzova, Professor, Doctor of Biology  
N. P. Chizhikova, Professor, Doctor of Agriculture

*The book is recommended by the Educational and Methodological Commission  
of the Faculty of Soil Science, Moscow State University,  
as a manual for students specialized in soil science 06.04.02*

**Sokolova T. A.**

С 59 Soil acidity and the acid–base buffering of soils. Manual. /  
T. A. Sokolova – М.: «КДУ», «Университетская книга», 2016  
– 64 с.

ISBN: 978-5-91304-625-3

The manual considers natural and anthropogenic factors of soil acidification, forms and parameters of soil acidity and methods of their determination, reclamation principles of acid soils, the concept of the acid–base buffering of soils. The main educational sources are cited.

The manual can be used for the courses of lectures in Soil Science, Soil Chemistry, and Ecology.

Оригинал–макет подготовлен в издательстве «КДУ».  
Формат 60×90 1/16. Бумага офсетная.  
Печать цифровая. Заявленный тираж 500 (печать по требованию).  
Издательский дом «КДУ»: тел. +7 (495) 638-57-34, [www.kdu.ru](http://www.kdu.ru).

УДК 631.415.1  
ББК 40.3я7

© Sokolova T. A., 2016  
© KDU, 2016

ISBN: 978-5-91304-625-3

# CONTENTS

<b>Chapter 1. Soil acidity</b> .....	<b>5</b>
1.1. Natural and anthropogenic factors of soil acidification.....	6
1.1.1. Natural factors of soil acidification.....	7
1.1.2. Anthropogenic sources of soil acidification.....	12
1.1.3. Comparing the roles of natural and anthropogenic factors in soil acidification.....	14
1.2. Forms and parameters of soil acidity.....	15
1.2.1. Actual soil acidity and lime potential.....	15
1.2.2. Exchangeable soil acidity.....	19
1.2.3. Ph-dependent soil acidity.....	24
1.2.4. Degree of saturation of the soil exchange complex.....	27
1.3. Reclamation principles of acid soils.....	28
1.3.1. Liming as the main reclamation method of acid soils.....	29
1.3.2. Methods of calculating the lime requirements.....	30
<b>Chapter 2. Acid–base buffering of soils</b> .....	<b>35</b>
2.1. General concepts and terms.....	35
2.2. Potentiometric titration as the main method for the study and quantification of the acid–base buffering of soils.....	37
2.3. The main buffer reactions occurring during the interaction of soils with an acid. Concept of buffer zones.....	41
2.4. The main buffer reactions occurring during the interaction of soils with bases.....	45

