ENGLISH
FOR SPECIFIC PURPOSES
FOR MASTERS
OF CHEMICAL
SPECIALTIES
Teaching
manual
Zn+CuSO4
H2SO4

Educational issue

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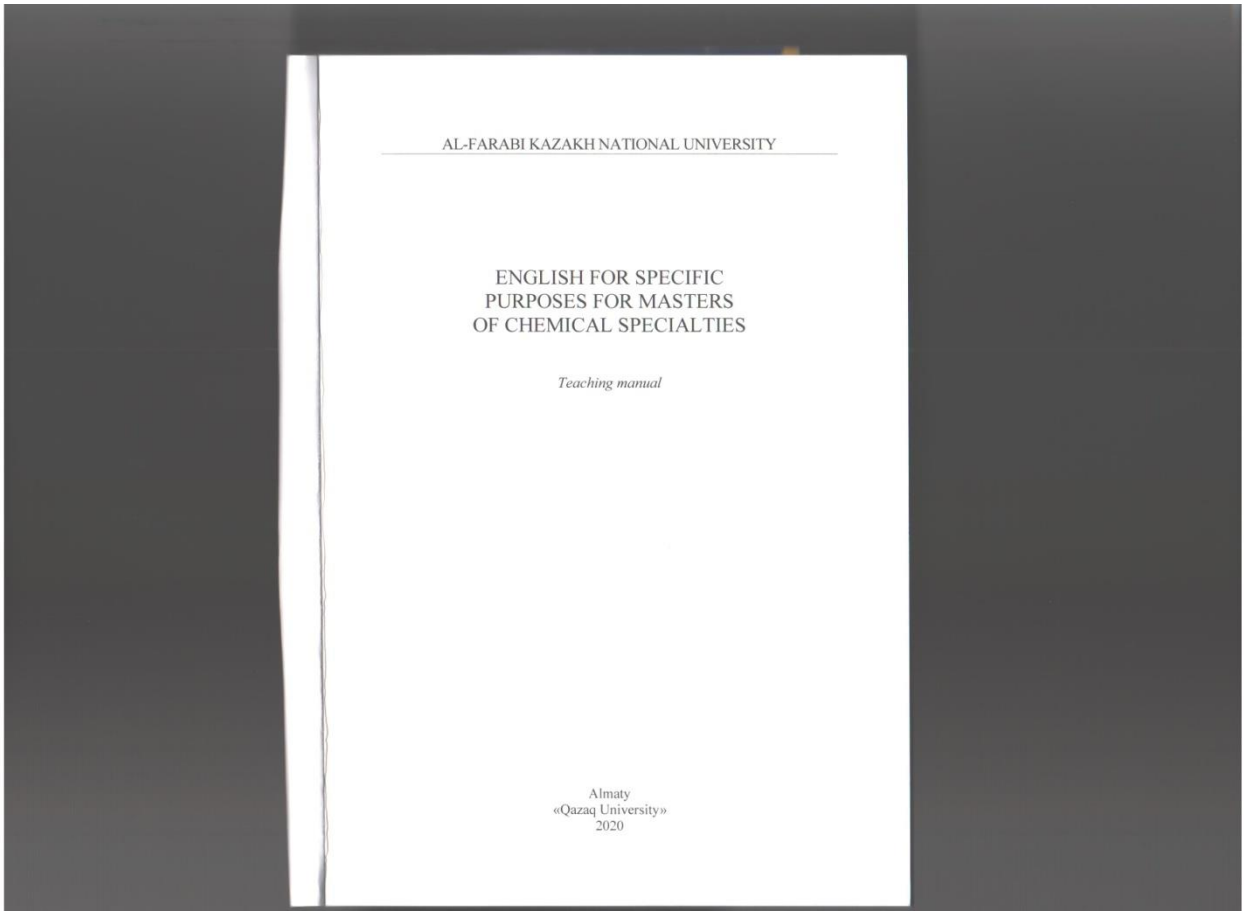

AL-FARABI KAZAKH NATIONAL UNIVERSITY

ENGLISH FOR SPECIFIC PURPOSES FOR MASTERS OF CHEMICAL SPECIALTIES

Teaching manual

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E 12 **English** for specific purposes for masters of chemical specialties: Teaching manual / D.M. Makhmetova, E.I. Lugovskaya, Z.S. Nessipbayeva, [et al.]. – Almaty: Qazaq University, 2020. – 104 p.
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The manual is based on the authors' research in the field of the translation of a scientific-technical text. The given manual discusses the translation methods of attributive word combination frequently-met in the scientific-technical text, impersonal passive constructions, and gerund constructions with the conjunctions: while, when, after, before, the rules of the lexical combinability of terminological units. Participle I, Participle II and the rules of reading chemical equations, formulas and mathematical symbols. The manual is aimed at developing the competences necessary for using English in professional communication.

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PREFACE

The manual is designed for the master students of chemical faculties. The manual consists of 15 units. Each unit includes the theoretical material on grammar and lexis which can be frequently-met in scientific-technical texts. The exercises are accompanied by the practical tasks in the form of translation exercises, transformational exercises, gap-filling exercises. The first unit of the manual considers the rules of reading chemical formulas, equations, mathematical symbols and SI.

One of the most peculiar features of the manual is that it includes the transformational exercises which are aimed at improving the writing skills of the master students. These exercises help the master students understand the mechanism of using the given grammatical construction in the scientific text. Also this type of exercises can be used for foreign students. These exercises gradually improve the quality of the scientific writing of the students. To enrich the students' terminological vocabulary the manual includes the texts on the specialty accompanied by the detailed vocabulary. The manual explains the rules to make up word combinations with terminological units.

The manual contains the texts on pyrotechnics, nanoscience, petrochemistry, oil and gas engineering, organic chemistry, inorganic chemistry. Selecting the texts for the manual the authors take into account the majors which are offered by chemical faculties at the master program. At the end of the manual there are grammatical tests on the grammatical phenomena which are considered in the manual and texts for additional reading.

Unit 1

HOW TO READ CHEMICAL FORMULAS, EQUATIONS AND SYMBOLS

Vocabulary

an equation – уравнение
a formula – формула
a power – степень
a degree – градус
a sign – знак

The figure before the compoud is a number of molecules we should read this way: $2MnO_2$ ['tu: 'mɔlɪkju:lz əv'em'en'ou 'tu:]

$(OH)_2$ – [ou eitʃ tu taimz]

Fe (II) – iron Roman two

H^+ – hydrogen ion ['haɪdrɪdʒən 'aɪən] or univalent positive hydrogen ion
['ju:nɪˌveɪlənt 'pɔzətɪv 'haɪdrɪdʒən 'aɪən]

Cu^{++} – divalent positive cuprum ion ['daɪveɪlənt 'pɔzətɪv 'kju:prəm 'aɪən]

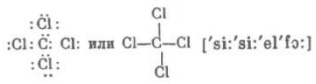
Al^{+++} – trivalent positive aluminium ion ['tri:ˌveɪlənt 'pɔzətɪv ˌælju'mɪnjəm
'aɪən]

Cl^- – negative chlorine ion ['negətɪv 'klɔ:'ri:n 'aɪən] or negative univalent
chlorine ion ['negətɪv 'ju:nɪ'veɪlənt 'klɔ:'ri:n 'aɪən]

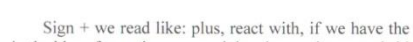
Ca^{2+} – calcium plus three

Ca^{3-} – calcium three negative

Sign – *or* **:** means bond and we don't read it:



Sign = *means* **: :** two bonds and we don't read it either:



Sign + we read like: plus, react with, if we have the plus on the both sides of equation, we read the plus on the second side as and.

Sign = we read like: to give or to form

Sign → we read: to give, to produce, to yield

Sign ↔ we read as: forms или is formed from

In the chemical equation in English we read the names of the compouds with the help of letters, for instance:

$4HCl + O_2 = 2Cl_2 + 2H_2O$ ['fɔ: 'mɔlɪkju:lz əv 'eɪtʃ 'si: 'el 'plʌs 'ou 'tu: 'gɪv 'tu:
'mɔlɪkju:lz əv 'si: 'el 'tu: end 'tu: 'mɔlɪkju:lz əv 'eɪtʃ 'tu: 'ou]

$Zn + CuSO_4 = Cu + ZaSO_4$ ['zed 'en 'plʌs 'si: 'ju: 'es 'ou 'fɔ: 'gɪv 'si: 'ju: 'plʌs 'zed
'en 'es 'ou 'fɔ:]

$PCl_3 + 2Cl \rightarrow PCl_5$ ['pi: 'si: 'el 'θri: 'plʌs 'tu: 'mɔlɪkju:lz əv 'si: 'el 'giv 'pi: 'si:
'el 'faɪv]

Also we can read chemical compounds in the equations using their names, for example:

$C + O \rightarrow CO$ – carbon plus oxygen yields carbon oxide

Powers

x^2 – x squared, x square

x^3 – x cubed, x cube

5^3 – five to the third power, the third power of five, five cubed

5^{-4} – five to the minus fourth power, the minus fourth power of five

5^2 – five to the second power, the second power of five, five squared

$\sqrt{4} = 2$ The square root of four is two

The square root out of four is (equals) two

$\sqrt[3]{27} = 3$ The cube root of twenty seven is three

$\sqrt[4]{16} = 2$ The fourth root of sixteen is two