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**An Integrated Approach to Teaching
Pronunciation and
Terminology for Chemical English
Students**

WHY IS PRONUNCIATION IMPORTANT in ESP?

Phonetics skills are necessary for:

- oral language development
- skills of reading, writing and perception
- realizing complex relationship between spelling and pronunciation

PRONUNCIATION:

- is the greatest source of intelligibility failure;
- an integral part of the entire learning process

G. Kelly:

“There are two key problems with pronunciation teaching. Firstly, it tends to be ***neglected***. And secondly when it is not neglected, it tends to be ***reactive to a particular problem*** that has arisen in the classroom rather than being strategically planned” [*How to Teach Pronunciation*”, London, Essex, Pearson Education Limited, 2000, p.13].

SOME GENERAL REQUIREMENTS:

- teacher's good grounding in theoretical knowledge;
- clear planning with regard to curricula and syllabuses;
- application of a variety of techniques and activities;
- access to good ICT tools and resources;
- native-language oriented teaching process;

L1 and L2 interference consideration

- for avoiding typical pronunciation errors in speaking and reading –
 - in articulation of vowels and consonants, in stress, rhythm, and intonation

Pronunciation module for chemical students

- phonetics is taught on the basis of professional chemical terminology;
- the sources: current research papers in chemical technology, special dictionaries etc.
- **ADVANTAGES:**
 - students' intelligence involvement as this approach employs material relevant to them.

two key methodological problems:

- 1) selection of the teaching material;
- 2) its presentation in the course.

SOLUTIONS: a list of the chemical terms for pronunciation training.

the main criterion: not their frequency but possible pronunciation difficulty (e.g. **phthalocyanine**, **macroheterocycles**, **grinding**, etc.); mispronunciations as the result of the native language interference:

acetone – Russ. ацетон);

occurrence of homographs (e.g. **lead** /li:d/, v – lead /led/, n.) and homophones (iron, ion /aɪən/);

exceptions (**granite** /ˈgrænɪt/);

words with several phonovariants (e.g. **kinetics**: ˈkɪnɪtɪks, ˈkɪnɪtɪk- /
, ˈkɪnɪtɪkɪz, ˈkɪnɪtɪk-, kɪnɪtɪk/, etc.

RHYTHM AND INTONATION

Speech perception mechanism:

- “ English speakers rely as much on rhythm to identify words as on the consonant and vowel sounds” (Wong, R. ‘Pronunciation Myths and Facts”, Teacher Development. Making the right Moves. Selected Articles from the English Teaching Forum 1989-1993, Washington, United States Information Agency, 1996, pp.115-119.)
- **OUR EXPERIENCE:** pay special attention to the exercises in rhythm, stress and intonation as individual sounds can be trained by means of various Internet sources, independently (for example, [8, 9, 10,11]).

EXAMPLES of some specially devised productive exercises and tasks

- *Reading chemical lexis with a typical first syllable stress:* □compound, □oxygen, □molecule, □methyl, etc.
- *Contrast stress in Russian and in English international chemical terminology:* ок□сид, хло□рид, суль□фат, ме□талл, эле□мент etc. vs. □oxide, □chloride, □sulphate, □metal, □element, etc.
- *English chemical terminology pronounced with the primarily and secondary stress:* electrochemistry, homogeneous, spectrophotometric, potentiometric, polymerization, etc.
- *Stress shift in derivatives:* □atom- a□tomic; □carbon – car□bonic; □molecule - mo□lecular, etc.
- *Stress shift in word combinations:* analytical applications, heterogeneous analysis, acid-resistant cement, air-corona removal of phenols, diffusion controlled second order rate constant, etc.
- *6) stress and rhythm:* group/group seven/ group seven elements/ group seven elements chlorine, bromine, iodine; test/test tube/ a glass test tube, a clean glass test tube/.....with a stopper.

FOCUS ON:

- frequent **mispronunciations** of the suffixes, Participle II endings (cf.: **heated, cooled, mixed**);
- **proper names** of the great scientists, physical and chemical units (**joule, Roentgen, Angstrom, volt, curie**, etc.),
- names of the elements from the Periodic Table, chemical and mathematical symbols,;
- pronunciation of Greek letters and some Latin expressions (**ab initio, in vitro, in situ**, etc).

STRUCTURE OF THE MODULE

- **PART 1** (*“from a sound to a letter”*) : some traditional theoretical information (on physiology of pronunciation, articulation of vowels and consonants, stress, rhythm and intonation in English) and a broad variety of practical exercises for developing productive and receptive skills.
- **THE TASK**: to familiarize students with the conventions of the phonemic transcription, learn to use phonemic chart.

THE SECOND PART:

- **spelling-oriented (from a letter to a sound):** the main rules and exercises on the typical relationships between spelling and pronunciation (<e, ee, ea, ie, ei> etc. as /i:/ in the words like *species, peel, weak, achieve, receive*;
- consonants and digraphs <ch> as /tʃ/, /k/, /k/ in the words like *chain, machine, chloride*).
- Listening, transcribing, reading (alone, in pairs, in groups), imitation and eliciting on the basis of a student's research papers;

CONCLUSIONS

- unwise to ignore pronunciation in any language course;
- pronunciation supports other skills: listening comprehension, spelling, grammar, word-stock, and reading;
- effective results of teaching can be achieved by a creative combination of the teachers' enthusiasm, students' efforts and information and communication technologies which facilitate the efforts made.

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