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The most productive prepositive components  
and their functions in the modern Ukrainian  
scientific-technical terminology

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Najbardziej wydajne przyimkowe składniki i ich funkcje we współczesnej  
ukraińskiej terminologii naukowo-technicznej

INTRODUCTION

The lexical system of Ukrainian vigorously borrowed words and components. Loanwords at the present stage of development of Ukrainian linguistics are investigated by E. A. Karpilovska, L. P. Kyslyuk, N. F. Klimenko, S. M. Klymovych, I. Kochan, D. V. Mazurik, A. Serbenska, O. A. Styshov [1–9]. Since the development of the vocabulary is primarily in the development of word formation, special importance is the study of word creative performance. The semantics of the word “performance” is quite broad, so among researchers, there is no consensus on the clear signs of the term. As in Ukrainian and in foreign linguistics has not yet developed clear criteria for admission linguistic units to productive or unproductive (quantitative measure as the main criterion is not essential in determining the performance). According to N. Klimenko, performance is „the ability of derivational means and ways to participate, and structural word types – be a model in the creation of new words” [10: p. 534]. We agree with the opinion of the researcher, the current language productive ways of word formation is a composition, abbreviation and intermediate between abbreviation and composition (мотобол, мотовагон), composition and jukstaposition [10: p. 534]. M. Pluch thinks that there is an independent productive derivational type that replenishes tumors. For most researchers the main measure of performance is the quantita-

tive description of the derivatives [11, 12, 13]. According to I. Uluhanov, performance is a relative concept, which indicates the ability of a particular type of word-formative function as a model, and word-formative affixes – to participate in the creation of new words [14: p. 135]. This is rightly thought T. Kade, who notes that the word building potential of language is formed from a set of potential all parts of speech, which in turn consist of a set of potential structural word jacks parts of speech, so the number of generators in these nests [15: p. 25–26]. Measure word creative potential charge unit is its performance – opportunity to be a model for the creation of new words, its quantitative characteristics, system [16: p. 13].

We agree with the opinion of N. Klimenko, who believes that the performance of word-formative type is not only in its ability to be a model for the creation of new words, but also in the relative weight of the vocabulary of the language. Productive derivative types have open series of words [10: p. 534]. In our work, we take the main performance criteria a quantitative indicator that detects a foreign language component. Performance of foreign components associate with their derivational activity, the ability to form new terms to identify the full valence derivative, combined with both specific and other language basics, that its potential is derivative components.

Depending on the activity of the derivative component and the number of derivative terms, we identified the most productive (from 50 derivatives) and productive (15 to 50 derivatives). Note that the proposed classification in the structural word types in order of performance reflects the position at the beginning of the 21<sup>st</sup> century and applies scientific terms with foreign components, as carried on their material.

The analysis of linguistic material allowed us to identify the most productive prepositive 7 components through which is formed from 70 to 230 derivatives.

Thus, we identify the most productive following components:

– **вібро-** (Latin *vibro* – oscillate, wriggle) composed of components, it has a value that corresponds to the word meaning „vibration”. We recorded about 110 derivatives with prepositive component **вібро-** in the scientific-technical terminology. Linguistic analysis showed that terminology within this type occurred derivational model  $PrK + N \rightarrow N$  (*вібромлин, віброшаблон, віброзанурення, віброзмішувач, віброочищення*);  $PrK + N + N \rightarrow N$  (*віброелектропривід, віброкардіограма, віброкардіограф, віброкардіографія, вібросейсмограма*).

The largest group consists of terms coined for the first model, the smallest is the second group of terms (5 terms in accordance with the processed material). Composites with this component indicate:

1) the names of devices, equipment, machinery, parts: *віброаналізатор, віброгасник, віброгрейдер, вібродатчик, вібродозатор*;

2) the names of activities and processes: *віброактивація, вібробуріння, вібровакумування, віброзатирання, вібропресування;*

3) the names of methods and techniques to perform actions: *вібродіагностика, вібродіагностування, віброкардіографія, віброліття, віброобробка;*

4) the names of types of graphics, prints: *віброграма, віброкардіограма, вібросейсмограма;*

5) set of something: *вібромашини, відротехніка, віброшуми;*

6) the names of the properties, qualities, states: *віброізоляція, віброміцність, віброповзучість, вібростійкість;*

7) the names of the material: *вібробетон;*

8) the names of variables: *вібропереміщення, віброприскорення;*

9) medical terms: *вібромасаж, вібромасажер, вібротравма.*

The largest group of terms refers to the technical devices, equipment, machines and their parts. Separately, you can allocate time *віброфон* – musical instrument that does not belong to any group. Also recorded two terms in which the component **вібро-** is in the second position in the word: *гідровіброуцілення, шумовіброізоляція.*

We can talk about the high performance of this component in the twentieth century, and it is worth noting that a lot of terms formed from specific basis: *віробулава, віброзбудники, віброживильник, вібродопата, вібромір;* we can say that the trend to hybridization continues.

Component **вібро-** also easily combines with Latin bases (*віброактивація, віброгенератор*), as well as Greek (*віброграма, віброінвертор*), French (*вібросонд, вібропрес*), German (*віброшаблон, віброштанга*), English (*віробункер, вібростенд*).

Thus, the component **вібро-** is very productive at the present stage of terminology and it is used to refer to the terms in engineering industry.

– **кріо-** (грец. Kryos – cold, ice), composed of composites as the first part shows the connection with ice, low temperatures. There were more than 50 derivatives of the original component **кріо-**. The terms of this component is created by model:

$\text{PrK} + \text{N} \rightarrow \text{N}$  (*кріогенератор, кріозахист, кріокабель, кріомір, кріоохолодження, кріоустановка*);

$\text{PrK} + \text{N} + \text{N} \rightarrow \text{N}$  (*кріовіскозіметр, кріолітійніт, кріотурбогенератор*).

The largest group consists of terms coined for the first model, a few – by the second model.

Composites with this component indicate:

1) the names of science and sections: *кріобіологія, кріогеніка, кріоелектроніка, кріофізика, кріохімія;*

2) the names of devices, appliances, fixtures: *кріоаплікатор, кріогенератор, кріомір, кріопротектор, кріостат, кріотурбогенератор;*

3) the names of activities and processes: *кріобіоз, кріозахист, кріомагнетизм*;

4) the names of methods and techniques to perform actions: *кріометрія, кріоскопія, кріосорбація, кріотерапія*;

5) the names of substances and materials, minerals: *кріоген, кріогідрат, кріокабель, кріокристал, кріоліт, кріосорбент*;

6) set of something: *кріоінструмент, кріосфера, кріотехніка*.

Of the analyzed language material is difficult to establish the largest group of component **кріо-** as almost the same number of words is included in each group. Component **кріо-** combines with Greek (*кріогідрат, кріокристал, кріоліт*), Latin (*кріогенератор, кріосорбація, кріосорбент*), German (*кріоагент, кріоген, кріокабель, кріопанель*) bases and formes hybrid derivatives such as *кріодія, кріозахист, кріонастка, кріопідтримка, кріоустановка*.

In the present terminology component **кріо-** is quite productive. We recorded some composites used in scientific texts but no codification in dictionaries

(*кріовплив, кріодеструкція, кріопідтримка*).

– **мета-** (грец. meta – after, due) in the complex words matter “intermediate position, change, transformation, liberation from something”. With this component formed about 80 derivatives. The largest group consists of composites formed by model PrK + N → N (*метаболізм, метаморфізм, метамлазма, мета теорема, метазастосування, метаманетик, метанісковик, метатранслятор*), small group are terms coined by model PrK + N + N → N (*метажемоглобін, метанараїнформація, метансевдо-інформування, метакхроматизм*).

Composites with this component indicate:

1) the names of science and sections: *металогіка, метаманетизм, метаматематика, метаналеонтологія, метафізика*;

2) the names of variables, symbols: *метазмінна, метамодель, метаобраз, метаоригінал, метаорієнтант, метасимвол*;

3) the names of actions, processes, phenomena: *метаморфізм, метаморфоз, метанефрос, метасезон, метасоматизм, метасоматоз, метакхроматизм*;

4) the names of methods, techniques to perform actions: *метазастосування, метанараїнформування, метасоматизм*;

5) the names of minerals and rocks: *метаварисцит, метаконгломерат, метаморфії, метанісковик, метацейнерит*;

6) set of something: *метанараїнформація, метаправила, метапрограма, метасистема, метаструктура, метафайл*;

7) medical and biological terms: *метаболіти, метажемоглобін, метамери, метаталамус, метафлора, метафос*;

8) philological terms: *метамова, метамлазм, метасюжет, метатеза, метатекст, метафраза*;

9) the names of devices: *метатенк, метатраслятор*.

With the entire array of analyzed material is difficult to identify the largest group of composites, each group containing approximately the same number of words. Component *мета-* joins the Greek foundations (*метамagnetизм, метапрограма, метасистема*), Latin (*метатранслятор, меттрансформація, метаформула, метацентр*), German (*метацейнерит*), English (*метатанк, метафайл*), French (*метамодель, метаоригінал, метаорієнтація*) and Ukrainian (*метазастосування, метазмінна, метамова, метаповідомлення*). Component *мета-* continues to increase its productivity in modern terminology.

– **метало-** (Latin *metallum*, Greek *metallon* – mine), in the composites means “metal”, “metallic”, which concern with metal. Linguistic analysis made it possible to identify about 70 derivatives of this component. The terms of this component formed by the models, as in previous cases: PrK + N → N PrK + N + N → N.

The most high-capacity group are terms coined for the first model (*металобрухт, металовироби, металозамінник*), several terms formed by the second model (*металогенограма, металомікроскоп, металополімери*).

Composites with component **метало-** signify:

1) the names of scientific fields and sections: *металогенія, металографія, металознавство, металофізика, металохімія*;

2) the names of devices, appliances, parts: *металовідбивач, металовоз, металограф, металокорд, металомікроскоп*;

3) the names of persons in the profession: *металознавець, металофізик*;

4) the names of actions and processes: *металометрія, металопланування, металопрокат, металотермія, металохромія*;

5) the names of the ways and methods: *металокераміка, металообробка*;

6) the names of sets, union: *металобрухт, металовироби, металовідходи, металопродукція*;

7) the names of industries: *металопромисловість*;

8) the names of materials, substances: *металоволокно, металомагнетик, металопласт, металопластика, металочерепця*;

9) the names of plants, buildings, premises: *металокомбінат, металоконструкція, металоцентр, металоцех*;

10) the names of the properties, qualities of objects, events and processes: *металомісткість, металоносність, металоподібність, металофон*.

This classification did not include the word *металопротеїди* – complex proteins composed of molecules, which contain ions of one or more metals. Component **метало-** is very efficient at the present stage of development of the Ukrainian language, which is a part of terminology, such as a steel industry which is actively developing in the 21<sup>st</sup> century. Therefore, to name concepts need new nomination. Component **метало-** combined with Greek (*металографія*,

металофізика), Latin (металоконструкція, металопродукція), French (металогравюра, металокомбінат), German (металоінвестиція), Ukrainian (металовироби, металовідходи, металознавець) bases.

**п'єзо-** (грец. *piezō* – press), the first part of compound words that means „pressure”, „push”. There were more than 50 derivatives of the original piezo-electric component. Terminology vocabulary of this component is created by the model PrK + N → N (*п'єзодзвоник, п'єзодіод, п'єзоелектрик, п'єзомодуль, п'єзоперетворювач, п'єзопровідність, п'єзоретроductor*); PrK + N + N → N (*п'єзоізобати, п'єзоізогіна, п'єзонанівпровідник, п'єзотензометр*). The most powerful group are terms coined for the first model, a small – formed by the second model.

Composites with this component signify:

- 1) the names of scientific fields and sections: *п'єзооптика, п'єзохімія*;
- 2) the names of actions, processes, phenomenon: *п'єзодинамометрія, п'єзоелектрика, п'єзоефект, п'єзокристалізація, п'єземагнетизм, п'єзотропія*;
- 3) the names of devices, appliances, fixtures: *п'єзовібратор, п'єзодвигун, п'єзодіод, п'єзоелемент, п'єзопроductor*;
- 4) the names of substances and materials, minerals: *п'єзоелектрик, п'єзокварц, п'єзокристал*;
- 5) the names of the properties, qualities of objects, events and processes: *п'єзопровідність, п'єзосприйнятливість*.

Component combined with Latin (*п'єзоелемент, п'єзоефект, п'єзопроductor*), German (*п'єзовібратор, п'єзокварц*), French (*п'єзокристалізація*), English (*п'єзотранзистор*), and Ukrainian (*п'єзодавач, п'єзодзвоник, п'єзоперехід*) bases.

The largest group consists of the terms to describe devices, appliances, parts. At the present stage of terms, the component **п'єзо-** continues to increase your word building potential. Please note that the number of hybrid terms with this component increases.

– **пневмо-** (Greek *pneuma* – air breathing), in composites means “acting with compressed air”. We recorded about 80 derivatives with the prepositive component **пневмо-**. In modern terminology composites with component **пневмо-** are formed by model PrK + N → N (*пневмоакумулятор, пневмоглушник*); and PrK + N + N → N (*пневмоелектроперетворювач, пневмозоловидалення*). The most high-capacity group are terms coined for the first model; some words formed by the second model. There were words with component **пневмо-** in the second position – *гідропневмопривід*.

Composites with component **пневмо-** mean:

- 1) the names of appliances, devices, machines and their parts: *пневмоагрегат, пневмовикорчовувач, пневмодатчик, пневмодвигун, пневмомонок*;

- 2) sets of names: *пневмоэффект, пневмоінструмент, пневмолінія*;
- 3) the names of materials, elements, substances: *пневмобетон, пневмоємність, пневмореле*;
- 4) the names of actions and processes: *пневмовідсмоктування, пневмопошта, пневмотранспорт*;
- 5) the names of the methods and techniques: *пневмокласифікація, пневмотрамбування*;
- 6) the names of fields and sections: *пневмоавтоматика, пневмомеханіка*.

This classification did not include the word *пневмокостюм* – pressurized pilot suit.

The most numerous group of terms for naming devices, equipment, machinery, parts and equipment. Component **пневмо-** combined with Latin (*пневмоаккумулятор, пневмоінструмент*), Greek (*пневмосистема, пневмоциліндр*), German (*пневмодрозель, пневмомотор*), French (*пневмоавтоматика, пневмоагрегат*), Ukrainian (*пневморозподільник, пневмоударник*) bases.

Prepositive component **пневмо-** continues to increase its capacity at the present stage of terminology, since the branch of engineering grows rapidly both in Ukraine and abroad, and therefore there are new names for the names of actions, processes, components, products.

Component **пневмо-** has a second meaning – breathing, and composites consisting of matter “that which applies to the lungs”. This is a medical term. There were more than 20 derivatives. These terms are formed by model PrK + N → N (*пневмограма, пневмокок, пневмомасаж*), PrK + N + N → N (*пневмоманометр, пневмоманометрія, пневмонектомія*), PrK + N + N + N → N (*пневмоенцефалографія*). The terms of nearly the same number formed by the first and second models. For the third model created only one derivative.

Composites with component **пневмо-** are used in the medical field.

– **термо-** (Greek *therme* – fever) in compound words corresponds to the notion of “temperature”, “heat”. We recorded about 230 derivatives with prepositive component **термо-** in scientific terminology. Linguistic analysis showed that terminology within this derivational type is the model PrK + N → N (*термобарометр, термозит, термонанір*); PrK + N + N → N (*термобарокамера, термогідрографія*); PrK + N + N + N → N (*термогазоволюмометрія*). The most high-capacity group are terms coined for the first model, a small but powerful are terms coined by the second model, one term is formed by the third model.

Composites with this component indicate:

- 1) the names of devices, appliances, fixtures, machinery, parts: *термоанемометр, термобатиграф, термовізіон, термоелектрогенератор*;
- 2) the names of activities and processes: *термоабрація, термоадсорбація, термокарст, термотропізм, термобрикетування*;

3) the names of methods and ways of doing: *термокомпресія, термоперенос, термогравіметрія, термометрія, терморозвідка*;

4) the names of substances and materials: *термоантрацит, термозитобетон, термонапір, термобіметал, термофарба, термопластмаса*;

5) the names of the properties, qualities: *термов'язкопластичність, термов'язкопружність, термоеластичність, термонейтральність*;

6) the names of units: *термоелектрони, термовольт, термокатод, термоелектрод*;

7) the names of science and sections: *термоелектроніка, термохімія*;

8) the names of prints, graphics: *термофотографія*;

9) the names of organisms: *термофіли, термофоби*.

This classification did not include words *термопауза* – a layer of the atmosphere in which the temperature does not change with height; *термоперіодизм* – dependence of plant growth on daily changes in temperature; *термосифон* – engine cooling system, in which the circulation of water in the membranes of cylinders and radiators predetermined by varying density in hot and refrigerated conditions.

The most high-capacity group of terms for naming devices, equipment, fixtures, parts and names of actions and processes. There were two terms with the component **термо-** in the second position: *пінотермопласт, фототермопластик*, and one term with this component in the last position *термо-ЕРС*. Component is combined with other languages (Latin: *термоелемент, термокомпресія, термоконтакт*; Greek: *термоаналіз, термогідраліка, термостат, термоелектрон*; German: *термокомпенсатор, термошафа, термощтанга*; English: *термопринтер, терморезистор, термоліфт*; French: *термозонд, термореле, термолампа*) and with specific bases (*термокріплення, термомісткість, термовимикач*). Should note that terms-hybrids with a component **термо-** appeared much more in the last decade. Component is very productive and continues to increase its capacity with the development of science and technology, creating new series of derivatives.

## CONCLUSION

Thus, depending on derivational activity of components and the number of derivative terms, we have identified four most productive prepositive components which formed from 70 to 230 derivatives. Note that in the proposed classification, grammatical types, according to the degree of productivity, reflect the position at the beginning of the 21<sup>st</sup> century and apply scientific-technical terms with borrowed components, as carried on their material.



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## SUMMARY

The performance of prepositive foreign components in modern Ukrainian scientific and technical terminology are considered in this article; there are defined and singled out the most productive components. There were determined the word formation of compound words with these components. Terms with productive foreign components are classified into lexical-semantic groups.

**Keywords:** prepositive component, compound words, composites, semantics, lexical-semantic groups

## STRESZCZENIE

W niniejszym artykule analizowana jest wydajność przyimkowych składników obcych współczesnej ukraińskiej terminologii naukowej i technicznej. Zostają zdefiniowane i wyróżnione składniki o najwyższej wydajności. Określono konstrukcje wyrazowe złożone z tych składowych. Warunki, w jakich słowa ukraińskie wchodzą w relacje z elementami przyimkowymi obcych języków, pozwoliły zaproponować podział na grupy leksykalno-semantyczne.

**Słowa kluczowe:** składniki przyimkowe, złożone wyrazy, kompozyty, semantyka, grupy leksykalno-semantyczne