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TERMINOLOGIZATION OF COLOURONYMS OF METAL AND MINERAL ETYMOLOGICAL ORIGIN: THE EVOLUTIONARY ASPECT[1]

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Abstract. This paper is devoted to the study of French colouronyms and their terminologization in different subtypes of scientific discourse. The research is based on colouronyms of mineral origin "(jaune / vert / brun / rouge d') andalousite" and "quartz (blanc / rose)," as well as those of metallic origin – "jaune d'or" and "jaune / vert de chrome." The authors carry out an etymological analysis of all the above-mentioned lexical units and consider the main tendencies of the terminologization of words with the semantics of colour in French scientific discourse. The peculiarities of the terminologization of colouronyms of mineral origin are analysed in the chemistry and geology discourse subtypes, whereas trends in the use of colouronyms of mineral origin are presented in the chemistry and physics discourse subtypes.

The aim of this paper is to analyse the evolutionary tendencies of the terminologization of French colouronyms in the subtypes of scientific discourse to describe their common and diverging properties at different levels, i.e. structural-semantic, morphological, and syntactic.

The empirical material for the research comprises written scientific texts on chemistry (the *Annales de chimie et de physique* electronic archive of scientific journals), geology (the *Planète-Terre* electronic archive of scientific journals), and physics (the *Futura Sciences* electronic archive of scientific journals).

The research methods employed include etymological, component, structural-semantic, morphological, and syntactic analyses.

The terminologization of colouronyms is a long-term continuous evolutionary discursive process that can be observed in French scientific discourse from the nineteenth century until the present day. The authors investigate the evolutionary tendencies of colouronyms as emerging semantics of colour in lexemes that have not had it before, the development of new structural-semantic models, the increasing numbers of morphological categories of colour terms, the acquisition of new syntactic roles, and the gradual process of the semantic transformation of colouronyms. The transition of colouronyms from one subtype of scientific discourse into another while preserving the structural-syntactic forms and morphological and semantic categories indicates the correlation between the discursive subtypes and the convergence of their functional properties at different levels of the language system. Despite this interdiscursive con-

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nectedness, each of the subtypes manifests distinct boundaries, which can be revealed through the study of the semantic specificity of colouronyms and their terminologization in scientific discourse.

Keywords: colouronym, terminologization, scientific discourse, discourse evolution, semantics, morphological composition, syntax.

One of the most significant concepts in Russian and foreign linguistics has always been the concept of discourse, which has been studied extensively. The term first appeared in 1952 in an article by American linguist Zellig Harris entitled "Discourse Analysis," in which it is defined as "the sentences spoken or written in succession by one or more persons in a single situation" (Harris 1952: 3).

The definition of discourse typically offered by linguists is "a text immersed in a communication situation" (Arutyunova 1989; Baranov 1993; van Dijk 1998; Makarov 1998; etc.).

Of particular interest to linguists is the study of types and genres of discourse. One of the most dynamic types of discourse in terms of its development is scientific discourse, as modern science is developing in various fields: chemistry, physics, biology, medicine, etc. According to V. Karasik, "the main goal of scientific discourse is the process of deducing new knowledge about a subject or phenomenon, or their properties and qualities, presented in verbal form and conditioned by the communicative canons of scientific communication – the ultimate abstraction of the subject of speech, proof of the truth and falsity of various positions, and the logic of their presentation" (Karasik 2007).

At each stage of the development of a given scientific field, the vocabulary of the corresponding discursive subtype (scientific – chemical; scientific – biological, etc.) is enriched by the emergence of new terminology. In addition, the functional space of the subtypes of scientific discourse undergoes evolutionary transformations in various linguistic aspects: lexical, syntactic, morphological, etc.

Among the subtypes of scientific discourse, scientific and chemical discourse appear particularly appealing to study. This is because significant extralinguistic factors that contribute to the constant enrichment of the scientific and chemical language are evident in the global scientific and chemical community: new theoretical and practical discoveries and developments at the global level, the development of intercultural communication, the widespread production of chemical products used in various spheres of human activity, etc. The development of scientific and chemical communication contributes to the emergence of evolutionary transformations at various linguistic levels of scientific and chemical discourse: structural-semantic, morphological, and syntactic. A significant lexical feature of the functional space of scientific and chemical discourse is the emergence of new terminology that enriches the vocabulary of the language in this sphere.

Important terms used in the scientific and chemical fields include Colouronyms – that is, "colour lexemes that demonstrate many of the following linguistic features: semantic (chromatic and achromatic colours), morphological (adjectives and nouns), word-formative (substantives and adjectives), structural-syntactic (words and phrases)" (Volkova 2020: 67). Most colouronyms become colour terms through the process of terminologization, where lexemes of a neutral linguistic space are transformed under the influence of extra-linguistic factors and intra-linguistic processes into special terms belonging to a certain discursive subtype, in this case, scientific and chemical discourse. The active terminology of colouronyms in scientific and chemical communication is explained by the development of colour chemical production across the globe, in particular Russia and Europe. Of particular interest for the study of the terminology of colour lexemes in the French scientific and chemical discourse, because colour production in France is particularly advanced (there are numerous dye and dyestuff manufacturing plants in the country), and cooperation between France and Russia in the development, import and export of colour products is moving at a rapid pace.

We should point out here that the number of colouronyms has skyrocketed in recent times, and their names are created in the process of scientific and chemical activities related to colour production. The catalogues of French dye factories, for example, contain new and interesting names of colours creating during the development of new pigments. These colouronyms are also used in scientific and chemical publications and are of particular interest for linguistic analysis.

This article provides a comprehensive analysis of the features of French colouronyms in the scientific and chemical discourse, and studies trends in the use of these colouronyms in other discursive subtypes to determine the relationship and specific properties of various subtypes of scientific discourse. The material used is taken from French scientific publications published between the nineteenth and twenty-first centuries, which is of particular interest for a comparative diachronic analysis of complex transformations of various subtypes of scientific discourse. This time period was selected because the early nineteenth century was when terminologization in this area began, and, as such, it has been a long evolutionary process. The early 1800s marks the beginning of the active replenishment of specialized vocabulary in French scientific discourse, including colour terms. The terminological composition of scientific discourse has similarly undergone transformations at various linguistic levels since the nineteenth century, specifically, at the structural-semantic, morphological and syntactic levels. The evolution of terms used in scientific discourse is evident in the terminology of colouronyms in scientific discourse: the number of colour terms used in scientific communication starts to increase from beginning of the nineteenth century; their structure and meaning change; they acquire new functions in various linguistic aspects; and semantic transformations lead to their transitioning from one subtype of

scientific discourse to another. The appearance of colouronyms in various subtypes of scientific discourse is linked to the development of scientific communication thanks to the emergence of multidirectional colour studies across several scientific fields.

The purpose of this article is to study the trends in the terminology of French colouronyms in various subtypes of scientific discourse in order to determine common properties of, as well as the differences between, these discursive subtypes at various language levels (structural-semantic, morphological, and syntactic). The research is based on empirical materials taken form scientific texts of various persuasions: chemistry (the *Annales de chimie et de physique* electronic archive of scientific journals), geology (the *Planète-Terre* electronic archive of scientific journals), and physics (the *Futura Sciences* electronic archive of scientific journals). The following linguistic methods were used in the work: etymological analysis, component analysis, structural-semantic analysis, morphological analysis, and syntactic analysis.

Features of the Terminologization of Colouronyms in Different Subtypes of Scientific Discourse

The colouronyms used in scientific and chemical discourse have a multitude of origins. Using the examples found in various French-language sources (electronic archives of scientific journals, catalogues of dye factories, and art workshops), we have developed a classification of colouronyms based on their etymology. ***Colouronyms of mineral origin*** include the name of the mineral: *bleu outremer, rouge de rubis, vert malachite, blanc de diamant,* etc. ***Colouronyms of organic origin*** include the name of the organic product: *blanc d'oeuf, rouge cerise, jaune canari, vert olive,* etc. ***Colouronyms of metallic origin*** are based on the name of the metal: *gris d'acier, vert de chrome, brun bronze, blanc d'argent,* etc. ***Colouronyms of synthetic origin*** are based on the colours obtained by the chemical synthesis: *bleu de Prusse, rouge anglais, vert-russe, noir indien,* etc. (Volkova 2020: 69).

Let us consider the features of the use of colouronyms of each type in the scientific and chemical discourse and other subtypes of scientific discourse using the examples below.

Colouronyms of mineral origin

(Jaune/vert/brun/rouge d')andalousite – (yellow/green/brown/red) andalusite. This colouronym contains semantics relating to the colour of andalusite, the underlying name (*andalousite*). Andalusite is a mineral named after the place where it was discovered – Andalusia (*Andalousie*). The stone was originally called "red-violet diamond feldspar."

In terms of appearance, the stone is a group of polymorphic crystals in the form of quadrangular prisms or radial agglomerate. Andalusite can have different colours: red, pink, green, brown, grey, or yellow. It can be matte, translucent, or transparent, and it

also exhibits pleochroism properties, that it, it is able to absorb the sun's rays thanks to its glass surface.

Andalusite is of great interest for scientific and chemical research because of its chemical composition (*Al2(SiO5)*). The mineral is a type of silicate, more specifically a salt that combines silicon dioxide with other metal oxides such as aluminium hydroxide. It contains aluminium, magnesium, iron, calcium, potassium, sodium and many other elements. These components give the stone good heat resistance, and it does not alter as a result of temperature changes, meaning that it is of great value for the metallurgical industry (Pierre Andalousite[2]).

The lexeme "*andalousite*" is widely used in scientific and geological discourse in its direct meaning – that is, the name of the mineral. The colouronym derived from it *("Jaune/vert/brun/rouge d') andalousite*" also originally belongs to the scientific and geological discourse as a term describing a colour similar to the colour of the mineral. From the early nineteenth century onwards, this colour term has also been used in the field of chemistry. One of the earliest mentions of this colour term can be found in an article by French chemist M. Peschier entitled "Notice sur la Composition chimique des feldspaths et des serpentines communes" that appeared in a scientific journal in 1826: "[…] *j'ai porté mon attention sur le feldspath adulaire du Saint-Gothard, le vert en masse de Sibérie* […] *le blanc d'Auvergne et* ***l'andalousite*** *du Tyrol*"[3]. In this example, the lexeme "*andalusite*" is presented without a colour adjective and performs the morphological function of a noun, having in front of it the definite noun "la" in its truncated form. However, in the context of the publication, the name of the mineral acts as a colouronym, possessing the semantics of a pigment, and is used by the author in syntactic parallel with other colour terms, which also belong in the morphological category of nouns *(le vert en masse de Sibérie), (le blanc d'Auvergne),* as they mean "pigment, colour substance."

Today, the lexeme "*andalousite*" and the colouronym derived from it *("Jaune/vert/brun/rouge d') andalousite*" are used in both the scientific-geological and scientific-chemical discursive subtypes. For example, an article by French geologist Pierre Thomas examines the colour characteristics of the andalusite discovered in the village of Ploumanac'h on the Pink Granite Coast in Brittany: *"On voit 2 bancs quartzeux ... et 2 niveaux plus épais, riches en andalousite (****blanc à gris****).";* *"Ces minéraux néoformés sont constitués. de minéraux* ***noirs… de l'andalousite…*** *et de minéraux…* ***blancs, ou blancs à coeur sombre… de l'andalousite***"[4]. In this example, we can note the presence

[2] Pierre Andalousite. France Mineraux: site officiel. URL: https://www.france-mineraux.fr/vertusdes-pierres/pierre-andalousite/ (accessed 25.03.2021). (In French)

[3] Peschier M. 1826. Notice sur la Composition chimique des feldspaths et des serpentines communes. Annales de chimie et de physique: archive en ligne. 31. P. 295. URL: https://gallica.bnf.fr/ark:/12148/bpt6k65686063/f305.item (accessed 01.04.2021). (In French)

[4] Thomas P. 2010. Metamorphisme et tectonique dans l'encaissant du granite de Ploumanac'h, ile Milliau, Trebeurden, Cotes d 'Armor. Planet-Terre: archive en ligne. URL: https://planet-terre.ens-lyon.fr/image-de-la-semaine/Img318-2010-06-07.xml (accessed 01.04.2021). (In French)

of different variants of the lexeme "*andalousite*," which appeared in modern scientific discourse as a result of semantic evolutionary transformations: the lexeme "andalousite" is used as the name of a mineral with a colour adjective in the postposition *(andalousite blanc à gris*), or in the anteposition with the preposition *"de" (noirs/blancs de l'andalousite).*

In the scientific discourse up until the nineteenth century, similar structural models had the semantics of "colour mineral"; however, the transformations that have taken place in modern scientific discourse mean that these forms to the colouronym now have two meanings: colour mineral and mineral colour. Moreover, scientific research in the fields of geology and chemistry involving or concerning the discovery of new colours of the mineral "*andalousite*" carried out in between the nineteenth and twenty-first centuries have led to an increase in the number of colour options when it comes to using a similar colouronym: in addition to the adjectives *jaune, vert, brun,* and *rouge*, new colour lexemes have appeared that are part of the colouronym *(noir, blanc, blanc a gris).*

The evolutionary transformations that the colouronym "*andalousite*" went through in the period from the nineteenth to the twenty-first centuries in the structural-semantic aspect can thus be characterized as follows. Until the nineteenth century, the lexeme "*andalousite*" was used in the scientific and geological discourse to denote the name of a mineral. The process of semantic expansion that started in the 1800s saw "*andalousite*" used in the scientific chemical discourse first as the name of a mineral, and then as a colour term. Further structural and semantic transformations brought about a change in the form of a colouronym, a combination of the lexeme "*andalousite*" and various colour adjectives, initially monosyllabic (*jaune, vert, brun*), and then consisting of several components (*blanc a gris*). The process of simplification has led to the modern form of the colouronym being a truncated version of "*andalousite*," which can be used in combination with a colour adjective or on its own, and is frequently found in the geological and chemical discursive subtypes. Evolutionary changes in the colouronym also affect the syntactic component. Until the 1800s, the lexeme "*andalousite*," in the meaning of a mineral, performs the syntactic function of subject and object in a sentence. From the 19th century onwards, "*andalousite*" with the semantics of a colouronym acquires an additional definitional function. In modern scientific discourse, "*andalousite*" as either the name of a mineral or as a colouronym can act as the subject, object or modifierin a sentence.

Quartz (blanc/rose) – (white/pink) quartz. This colouronym is of a mineral origin, and it is widely found both in scientific and chemical discourse and in other discursive types due to its semantics: it is based on the name of the mineral "*quartz*," one of the most common stones on the planet. Quartz, which is also called "rock crystal," is found on all continents and is part of the cultural traditions of all countries. Ancient Greek philosophers, most notably Theophrastus, believed quartz to be a type of ice that could not be thawed. The chemical composition of quartz was discovered by

the Swedish chemist Jöns Jacob Berzelius in 1823. It is a siliceous rock with the formula *SiO2.* In its pure form, quartz is milky white and consists of individual crystals or groups of transparent crystals. It can come in black, yellow, green, or pink (Pierre Quartz[5]).

Until the 1800s, the lexeme "*quartz*" was a part of the terminology of geological discourse, used to denote a mineral. From the beginning of the nineteenth century, research in the field of chemistry brought about an expansion of the associated terminology, and the term "*quartz*" moved into the discourse of that discipline. The discovery of new colours based on the mineral "*quartz*" as a result of scientific and chemical experiments led to the appearance of the colouronym "*quartz*" in numerous colour variations in the chemical discourse – combinations of the name of the mineral with colour adjectives. Examples of such colouronyms are found in chemical texts dating back to the 1800s. In particular, in his *Sur la Dolomie du Tyrol,* L. de Buch mentions dodecahedron-shaped crystals with the colour and structure of grey quartz: *"… des cristaux de feldspath nacré brun et blanc-rougeâtre…", "des dodécaèdres bi-pyramidaux de quartz gris…"*[6]. Here, the lexeme "*quartz*" is used with the colour adjective "*gris*" and possesses dual semantics: the term "*quartz gris*" refers to both a type of mineral (grey quartz) and a colour (the colour of grey quartz). Thus, the semantic expansion that began in the early nineteenth century saw the lexeme "quartz" enter the discourse of the scientific field of chemistry, where, in addition to the name of the mineral, it performs the semantic function of a colouronym.

From the 1820s onwards, the semantic evolution of the lexeme "*quartz*" in chemical communication continues as a colouronym, as evidenced by the increase in the number of structural and semantic models, which represent a combination of the name of the mineral and both colour and non-colour adjectives. For example: *"… lames courbes… disséminées dans du carbonate de manganèse rose… et du quartz blanc…"*[7]. In this sentence, the author uses the names of two minerals, "*manganese*" and "*quartz*" to refer to colour substances that interact with other chemical elements in order to obtain the results of the colour study. Both lexemes can be used with the colour adjectives "*rose*" and "*blanc*" in postposition. Thus, the combination "mineral + colour adjective" acquires the meaning of "colouronym with the etymology of the origin of the mineral." In this example, the respective colouronyms are "*manganèse rose*" (pink manganese) and "*quartz blanc*" (white quartz).

Let us look at the example of the use of the colouronym "*quartz*" with a non-colour adjective: *la matière insoluble était du quartz pur.* There are two possible translations of this sentence: 1) "… the insoluble substance was made from pure quartz"; or

[5] Pierre Quartz. France Mineraux: site officiel. URL: https://www.france-mineraux.fr/vertus-despierres/pierre-quartz/ (accessed 27.03.2021). (In French)

[6] Buch L. de. 1823. Sur la Dolomie du Tyrol. Annales de chimie et de physique: archive en ligne. 23. P. 398. URL: https://gallica.bnf.fr/ark:/12148/bpt6k65720303/f409.item (accessed 25.03.2021). (In French)

[7] Annales de chimie et de physique: archive en ligne. 1832. 51. P. 150. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

2) "the insoluble substance had the colour of pure quartz." Both are appropriate in this context, since the substance being reffered to had both the structure and colour of pure quartz. In the version that talks about colour, the name of the mineral "*quartz*" takes on the meaning of the colour "*quartz*," and the non-colour adjective "*pur*" takes on the semantics of "colourless." Thus, this example illustrates the terminology of the colouronym "*quartz pur*" (pure quartz) in the scientific (chemical) discourse, the structure of which is a combination of "mineral + non-colour adjective."

The most common uses of the lexeme "*quartz*" as a colouronym in the scientific (chemical) discourse are the following: *quartz hyaline* (hyaline/vitreous quartz); *quartz concretionne perle* (compacted pearl quartz); *quartz grossier* (rough quartz). Starting in the 1820s, the adjective "*quartzeux*" found its way into publications in the field of chemistry, formed as a suffix and carrying the meaning "*quartz*" with the colour connotation: "*On a pris deux espèces de sable, l'un blanc, entièrement quartzeux…* "[8]. In this example, the adjective "*quartzeux*" has a colour meaning and is used to enhance the semantics of the colour adjective "blanc" (white), that is, in this context, "*quartzeux*" means a snow-white colour.

The semantic expansion of the lexeme "*quartz*" in scientific (chemical) discourse saw the term pass into modern scientific (geological) communication as a colouronym. Thus, the lexeme "*quartz*" has two meanings in the scientific (geological) discourse of the twenty-first century: the name of the mineral and the colour term. In particular, in his 2021 article "Filons de quartz des Alpes et d'ailleurs," Thomas explores quartz deposits of various colours: "*Le filon lui-même, en quartz laiteux, est visible en bas de l'image, au centre*"; "*Les filons de quartz blanc se détachent au sein des grès argileux de couleur rougeâtre*"[9] (Thomas 2021). In these examples, the lexeme "*quartz*" contains colour adjectives in postposition (*laiteux, blanc*), which convey the semantic element of colour to the name of the mineral, and the combination "mineral name + colour adjective" acquires the semantics of "a mineral of a certain colour": *quartz laiteux* (milky quartz colours), *quartz blanc* (white quartz). Such combinations can turn into colouronyms, which, through terminologization, are implemented in scientific (chemical) discourse.

The structural-semantic evolutionary transformations of the lexeme "*quartz*" has led to its syntactic transformations. The name of the mineral "*quartz*" in geological discourse performs two syntactic functions: subject and object. Following the transition to scientific (chemical) discourse in the 1800s, "*quartz*" acquired the semantics of a colouronym and the syntactic role of a definition. At the same time, the colouronym "quartz," as it has evolved in chemical discourse, can also act as a subject or modifi-

[8] Annales de chimie et de physique: archive en ligne. 1825. 28. P. 142. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[9] Thomas P. 2021. Filons de quartz des Alpes et d'ailleurs. Planet-Terre: archive en ligne. URL: https://planet-terre.ens-lyon.fr/image-de-la-semaine/Img700-2021-01-25.xml (accessed 22.03.2021). (In French)

erin a sentence. Thus, as a result of syntactic evolutionary transformations in modern scientific discourse, the colouronym "*quartz*" can function as an attribute, subject or predicate.

Our analysis of the structural-semantic evolution of colouronyms derived from the names of minerals allows us to map out the relationship between the geological and chemical discursive subtypes. Until the nineteenth century, the names of minerals were used in geological discourse only. From the 1800s onwards, such lexemes started to move into the chemical discourse, becoming part of its terminology – first as the names of minerals, and then as colouronyms. As advancements are made in colour research in the field of mineral chemistry, the number of colour variants of mineral colouronyms also increases, as various colour adjectives are attached to the names of minerals. In the process of semantic evolution, various structural-semantic models arise; non-colour adjectives combined with the names of minerals acquire colour semantics and are in pre- and postposition in relation to the word that is being defined. There are various colour forms of colouronyms derived from the names of minerals, as well as numerous autonomous lexemes, in modern scientific (chemical) discourse. These are the result of structural-semantic simplification and they demonstrate dual semantics: names of minerals and names of colours based on minerals. Colouronyms of mineral origin have also moved into modern geological discourse and are used in it alongside the names of minerals. It is important to note that the relationship between the geological and chemical discursive subtypes depends on external factors: for example, minerals studied by geologists are used in chemical experiments, and colours obtained by chemists based on minerals are used in geological research. Thus, crossover studies in geology and chemistry lead to functional and semantic transformations in the geological and chemical discursive subtypes, which is the result of terminology transitioning from one discourse to another.

Colouronyms of metallic origin

Jaune d'or – yellow gold. This colouronym belongs to the group of colour terms of metallic origin, as it is a combination of the colour adjective "*jaune*" (yellow) and the name of the metal "*or*" (gold). Gold is one of the most popular metals all over the world, and it is used in a wide variety of areas of human activity.

Gold is a malleable and ductile metal of a shiny-yellow colour (the colour gold is also called "*dore*" (golden, gilded)) that is heavy and soft. Gold does not oxidize in water or air, and it is a good conductor of heat and electricity. Since Antiquity, the main purpose of the metal "*or*" was as a currency in commodity-monetary relations. Today, gold is also a precious metal and a profitable investment. The malleability of gold means that it is widely used in alloys in the manufacture of jewellery and architectural works. When mixed with other chemical elements, gold can take on different colours, such as white or pink. The metal "*or*" is also used in medicine to manufacture dentures.

Gold is widely used in chemistry and physics and can be found in certain wires and electrical connectors. Additionally, its ability to reflect infrared rays means it is used as a coating for the James Webb Space Telescope (Or[10]).

Researchers in various fields – most notably chemists, physicists and geologists – study the structure and properties of the metal "*or*." With this being the case, the name of this metal is actively used in the chemical, physical and geological discursive subtypes. Starting in the early nineteenth century, the lexeme "*or*" appears with increasing frequency in texts relating to chemistry, not only as the name of the metal, but also as a colouronym. The most common example is the structural-semantic model "*jaune d'or,*" which is a combination of a colour adjective and the name of the metal. Used in a sentence, this colouronym performs the syntactic function of a modifier and describes numerous terms used in the field of chemistry: *thorium jaune d'or; aldazine protocatéchique jaune d'or; chlorhydrate jaune d'or; sol. alcali jaune d'or; aiguilles jaune d'or, une couleur mate jaune d'or*[11]. In these examples, the colour combination "jaune d 'or" is in anteposition in relation to the chemical term being defined, and in most cases does not agree with it in terms of gender and number – that is, it has an unchangeable form (*aiguilles jaune d'or*).

Since the 1830s, the colouronym "*jaune d'or*" has been found in chemical texts not only as an adjective, but also in the morphological category of a noun. This is due to the increasing number of chemical studies of the colour gold, its properties and methods of production. Thus, in the scientific (chemical) discourse, the colouronym "*jaune d'or*" has evolved in the semantic aspect and, in addition to the meaning of the colour as an object of chemical research, it acquires the semantics of colour mass, substance and pigment. Used in a sentence, this colouronym is used autonomously, since it does not define a chemical term, but rather as an independent name for a chemical object, and performs the syntactic function of either subject or object. For example: *"… le métal est en couche miroitante d'un beau jaune d'or…"*[12]. In this example, the colour term *"jaune d'or"* is preceded by the indefinite article "*un*" – a morphological feature of the noun – and the adjective "*beau*" (beautiful) to describe the colour in question. As a noun, the colouronym "*jaune d'or*" is also used in combination with the verb "*colorer (en)*" without an article, in accordance with the rules of grammar: *"C'est du cuivre coloré en jaune d'or par un vernis…"*[13]; "*… une substance qui colore l'eau en jaune d'or…"*[14].

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[10] Or. Futura Sciences: site officiel. URL: https://www.futura-sciences.com/sciences/definitions/chimie-or-15360/ (accessed 29.03.2021). (In French)

[11] Annales de chimie et de physique: URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[12] Annales de chimie et de physique: archive en ligne. 1847. 20. P. 391. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[13] Annales de chimie et de physique: archive en ligne. 1891. 22. P. 154. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[14] Annales de chimie et de physique: archive en ligne. 1841. 2. P. 23. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

Also worth noting, in addition to the structural-semantic evolutionary transformations of the colouronym "*(jaune d)'or*," are its word-formative transformations in scientific (chemical) discourse. Starting in the 1840s, the colour verb "*(se) dorer,*" derived from the lexeme "or" appears in chemistry texts: *"Le cuivre se dore à sa manière habituelle*"[15]. This verb, in turn, forms the colour nouns "*dorure/dorage,*" which are used in scientific (chemical) texts and denote the process of colouring a chemical element in a gold colour: *"La dorure dufer est instantanée…*"[16]; "*Dorage de l'argent et du laiton…*"[17]. From the 1850s onwards, the derivative adjective "*dore*" formed from the noun "*or*" and having the semantics of "golden, gilded," also appears in scientific (chemical) discourse: *"… du laiton doré doit se comporter comme de l'or massif"*[18].

In the second half of the nineteenth century, an increasing number of studies carried out in the field of chemistry into colour based on the metal "*or*" started to appear. The process of simplifying the structural models of colouronyms is observed in the scientific (chemical) discourse of this period, and the colouronym "*jaune d'or*" is reduced to the single lexeme "*or*" with the semantics "gold, golden colour" (*litharge couleur d'or, vernis couleur d'or*). An increasing number of structural-semantic models emerge, influenced by scientific and chemical research aimed at obtaining different shades of gold based on the metal "*or,*" representing a combination of the lexeme "*or*" with various colour or non-colour adjectives in the anteposition. Used in a sentence, these colouronyms perform the syntactic function of subject or object, since the lexeme "*or*" belongs in such colour combinations to the morphological category of nouns, while at the same time denoting the name of the colour substance. For example, in his 1886 work *La Chimie des Égyptiens, d'après les papyrus de Leide,* the French chemist Marcellin Berthelot discusses the shades of gold obtained by mixing the metal "*or*" with various chemical elements. For example, the colour "*or mat*" (matte gold) is obtained by mixing saltpeter with aluminium sulphate and salt; "*or fin*" (fine gold) is the result of adding arsenic acid to gold; "*or rouge*" (red gold) is a mixture of gold and copper salt; and "or jaune" (yellow gold) can be obtained by adding saltpeter and ammonium chloride to gold[19]. A similar example of the use of this colouronym is found in other chemistry texts, where the lexeme "*or*" has a non-colour term in the anteposition (*l'or pur, l'or natif*).

Thus, as a result of the structural-semantic evolutionary transformations, as well as the word-formative, morphological and syntactic transformations, observed in the period from the nineteenth to the twenty-first centuries, the colouronym *"(jaune d')*

[15] Annales de chimie et de physique: archive en ligne. 1846. 18. P. 39. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)
[16] Ibid.
[17] Annales de chimie et de physique: archive en ligne. 1841. 73. P. 398. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)
[18] Annales de chimie et de physique: archive en ligne. 1881. 24. P. 66. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)
[19] Annales de chimie et de physique: archive en ligne. 1886. 9. P. 48. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

or" is used in modern scientific (chemical) discourse in the following variants: *(un / le / du) jaune d'or; N + jaune d'or; Adj + jaune d'or; V + Prep + jaune d'or; (l')or; (l')or + Adj; N + Prep + or; dore; (se) dorer.* As an adjective, the colouronym *"jaune d'or/dore"* defines the colour of chemical elements; as a noun, the colour term *"or (jaune)"* denotes the name of a colour substance or pigment; the derived nouns *"dorure/dorage"* refer to the process of colouring a chemical element gold; and as a verb, the colouronym *"(se) dorer"* has the semantics of a colour action, specifically, "to paint [sth.] gold."

Scientific research into the properties of the metal "*or*" and the colour "*jaune d'or*" is extremely diverse, which has led to the colouronym of the same name being used in other subtypes of scientific discourse, in particular geology and physics. In the nineteenth century, geologists used the lexeme "*or*" to refer to the name of the metal: *"… la masse d'or trouvée dans l'Oural en 1826 était inférieure en poids…"*[20]. From the 1900s onwards, the colouronym "*jaune d'or*," as it appears in geological texts, is most often found in the morphological category of adjective and noun: *"La couleur jaune d'or trouvée par Bouveault provident indubitablement de traces d'acides minéraux"*[21]. It is important to note here that many research papers devoted to the methods of obtaining the colour *jaune d'or* or the description of its characteristics can be described as belonging to both chemical and geological discourse, since they describe the origin of the metal "*or*" from which the colour is derived and discuss such aspects as gold deposits and the methods of extracting the metal.

The word "*or*" also undergoes structural-semantic transformations in the discourse of physics between the nineteenth and twenty-first centuries. When used to denote the name of the metal, the lexeme "*or*" acquires the semantics of a colouronym and evolves into the structural-semantic model "*jaune d'or*," which has been used in physics texts since the 1800s: *"… ces mêmes rayons (jaune d'or) arrivent isolement sur l'or…"*[22]. In most of these examples, the colouronym "*jaune d'or*" belongs to the morphological category of an inflexible adjective in the anteposition in relation to the physical term being defined. The colouronym "*jaune d'or*," as well as its truncated form "*or*," first appeared in works of physics in the 1830s as a result of structural-semantic simplification, with the semantic meaning of "golden colour": *"…or, dême que le blanc peut être considéré comme composé de jaune, de rouge et de bleu…"*[23]. In this sentence, the lexeme "*or*" is a colouronym and is used in the sense of "golden colour," in parallel with the colour terms "*blanc*," "*jaune*," "*rouge*" and "*bleu*," which also belong to the morphological category of nouns. The structural-semantic evolution of the colouronym "*(jaune d')or*" in the discourse of physics produces a number of different syntactic

[20] Annales de chimie et de physique: archive en ligne. 1843. 7. P. 244. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[21] Annales de chimie et de physique: archive en ligne. 1901. 19. P. 509. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[22] Annales de chimie et de physique: archive en ligne. 1817. 4. P. 195-196. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[23] Annales de chimie et de physique: archive en ligne. 1835. 58. P. 387. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

functions: the word combination "*jaune d'or*" serves as a definition, while the colouronym "*or*" in reference to a colour substance acquires the syntactic functions of subject and amplification.

In addition to the structural-semantic models noted above, it is important to note that the word combination "*jaune dore*" is used in modern physics as a variant of the colouronym *"jaune d'or": "... l'or se distingue des autres métaux par sa couleur jaune dorée"*[24]. The colouronym is a combination of the colour adjective "*jaune*" and the derived adjective "*dore*," which comes from the noun "*or*." The colour term "*jaune dore*" is used as a compound adjective. When used in a sentence, it serves as a definition, in the anteposition in relation to the word being defined, and agrees with it in number and gender.

On the basis of these and numerous other examples taken from the texts of works on physics, we can conclude that the colouronym "*(jaune d')or*" undergoes structural-semantic, word-formative, morphological and syntactic evolutionary transformations in the discourse of physics, as well as in other subtypes of scientific discourse, in the period from the nineteenth to the twenty-first centuries. In today's scientific (physics) communication, the colour term "*(jaune d')or*" is presented in various structural-semantic models (Adj + Prep + N, N + Adj, Adj + Adj), morphological categories (adjective, noun, verb), and syntactic roles (attribute, subject, object, predicate).

Jaune/vert de chrome – chrome yellow/green. This colouronym is of metallic etymological origin. It is a combination of the colour adjective "*jaune*" (yellow) or "*vert*" (green) and the name of the metal "*chrome*" (chromium).

Chromium is a transition metal used in engineering (for example, in the production of shock absorbers) and painting (in the production of paints). The first documented case of the use of chromium in metal objects dates back some twenty centuries to China. As a non-compound metal, chromium was discovered in 1798 by the French chemist Louis Nicolas Vauquelin. The name "chromium" comes from the Greek word "chroma," which means "colour," since the components of this metal are bright and multi-coloured (*Chrome*[25]).

Chromium is a hard, steel-grey metal that is highly resistant to corrosion and tarnishing. For this reason, chromium is widely used in metallurgy, preventing the destruction of metal objects and helping them maintain their characteristic shine. Chromium is also used in chemistry, specifically as a catalyst in some hydrogenation reactions. The metal is valued in the glass industry too, as chromium salts give glass a green tint. Chromium has a special function in painting, as salts of the chromic acid

[24] Deluzarche C. 2018. Pourquoi l'or brille jaune? Futura Sciences: site official. URL: https://www.futura-sciences.com/sciences/questions-reponses/matiere-or-brille-jaune-8875/ (accessed 22.03.2021). (In French)

[25] Chrome. Futura Sciences: site officiel. URL: https://www.futura-sciences.com/sciences/definitions/chimie-chrome-4691/ (accessed 01.04.2021). (In French)

H_2CrO_4, called chromates, are used to produce different colour palettes, depending on their interaction with other chemical elements (for example, lead-based chromates produce numerous shades of yellow) (Chrome).

Despite its numerous important properties, the use of chromium is limited in numerous spheres due to its toxicity. Some plant-based foods contain excess amounts of chromium, which can be harmful to human health. However, chromium compounds affect the human body in different ways. For example, chromium(III) oxide is an essential nutrient, a deficiency of which can lead to cardiovascular disease or diabetes. Meanwhile, excess chromium(VI) oxide in the respiratory tract causes irritation of the nasal mucosa and nasal bleeding. The reasons why chromium has certain effects on the human body have not been studied in sufficient depth, although specialists in the field of medicine and biology have discovered that this metal is a cofactor of insulin, facilitating the absorption of glucose by cells (Chrome).

Thus, chromium and its properties are the subject of research in chemistry, physics, biology and medicine. As a result, the name of the metal "*chrome*" is used widely in the respective discursive subtypes. Additionally, the use of chromium in painting has led to the term "chrome" being used in art history as well.

Like the colouronyms discussed above, the colour term "*chrome*" undergoes structural-semantic evolutionary transformations in the period from the nineteenth to the twenty-first centuries, which we can be observed in particular in the scientific (chemical) discourse. Up until the nineteenth century, the lexeme "chrome" is used in chemistry texts to denote the name of the metal. Starting in the 1800s, the word evolves into the structural-semantic model "*jaune/vert de chrome*," which acquires the semantics of a colouronym. Morphologically, the colour term enters the category of adjective, since its main function is to denote the colour characteristics of chemical objects. The form of the colour adjective "*jaune/vert de chrome*" in inflexible, and the adjective itself is in the anteposition in relation to the chemical term being defined: *couleur jaune/vert de chrome*. The colouronym "*jaune/vert de chrome*" is also used in chemistry as a noun, if the text is not about the characteristics of a given chemical substance, but rather gives a description of the colour itself and its properties: *une couleur d'un vert de chrome magnifique, l'aspect d'un jaune de chrome foncé, précipité d'un beau jaune de chrome, mélange de jaune de chrome et de blanc de céruse.* As a noun, the colouronym "*jaune/vert de chrome*" performs the syntactic function of subject or object in a sentence.

The structural-semantic transformations of the lexeme "*chrome*" can be explained by the increase in the number of studies in the field of chemistry on colours based on this metal. And numerous works have been published on the production of various colours using the metal lexeme "*chrome*." For example: "*… on obtient du sulfure de chrôme cristallin, d'un noir brilliant*"[26]. The discovery of new colours based on chro-

[26] Annales de chimie et de physique: archive en ligne. 1831. 47. P. 111. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

mium cause new colouronyms to appear in the scientific (chemical) discourse, which are combinations of the lexeme "chrome" and various colour adjectives: *un sel vert / violet de chrome, l'oxide brun de chrome.* When analysing examples of this, one cannot help but notice an interesting feature of the name of the metal "*chrome*": the spelling in scientific (chemistry) texts changes from "*chrôme*" in the first half of the nineteenth century to "*chrome*," which is how the French spell it today, around the second half of the nineteenth century.

Further structural-semantic transformations lead to the addition of an adjective (colour or non-colour) to the word combination "*jaune/vert de chrome*," a consequence of which is the transformation of the structural type *Adj + Prep + N* into a model of the form *Adj + Prep + N + Adj (jaune de chrome foncé, vert de chrome magnifique)*. In the latter half of the nineteenth century, a reverse process of structural-semantic simplification of colouronyms is observed. Thus, in addition to the combinations noted above, the lexeme "*chrome*" is used in chemical discourse not only as the name of the metal, but also with the meaning "colour, pigment," as a truncated form of the colouronym "*jaune/vert de chrome*." The semantic transformations of the lexeme "*chrome*" from the name of a metal to the name of a colour substance take place under the influence of the development of chemical research using chromium, in which scientists not only describe the colour characteristics of the metal, but also present the metal itself as the name of the colour. For example, the chemist Friedrich Wöhler studied the properties of chromium in the form of a grey crystalline powder: "*… le chrome reste sous la forme d'une poudre grise crystalline*"[27].

The lexeme "chrome" as a colouronym evolved in the scientific (chemical) discourse of the second half of the nineteenth century. Specifically, an adjective was added to it, transforming the form *N (chrome)* into a structural model of the type *N + Adj (chrome rose, chrome vert, chrome pur, chrome cristallin)*. These compound colouronyms are used in scientific (chemical) discourse as nouns (morphological category) and with the syntactic function of subject or object. Colouronyms of the *N + Adj* type can move into the morphological category of adjective and acquire the syntactic function of attribute, having a defined noun with the preposition "*de*" in the anteposition: *chlorure de chrome vert, sel de chrome neutre, sesquioxyde de chrome pur.*

Texts on chemistry also use the structural type *N + Prep + P* for colour terms containing the name *"chrome" (l'oxyde de chrome, le sulfate de chrome)* that have colour semantics, but no actual colour components. The presence of a colour meaning in such word combinations is due to the emergence of research in the field of chemistry into the methods for obtaining various colours based on the chemical synthesis of chromium, as a result of which both the metal itself and its components become a colour substance. For example, in their research work, the chemists M. Nilsson and

[27] Annales de chimie et de physique: archive en ligne. 1859. 56. P. 502. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

O. Pettersson describe the colour of chromium dichloride obtained through chemical synthesis: *"Le dichlorure de chrome préparé de cette manière est d'un blanc tirant sur le gris"*[28]. In turn, M. P. Hautefeuille and A. Perrey talk about red ruby-coloured crystals obtained by mixing aluminium oxide sulphate with chromium sulphate: *"… l'oxalate ou le sulfate d'alumine mélangés d'un peu d'oxalate ou de sulfate de chrome nous ont donné des cristaux colorés en rouge-rubis"*[29].

Another structural model used in chemistry texts in the second half of the nineteenth century needs to be mentioned here. This is a combination of the name "*chrome*" and a colouronym consisting of several components with the structural form *N + Prep + Adj + Adj (chrome d'un noir brilliant).*

In addition to structural-semantic evolutionary transformations, the lexeme "*chrome*" has also undergone word-forming transformations: starting in the 1850s, there is a noticeable increase in the number of colour terms derived from the lexeme "*chrome*" in the scientific (chemical) discourse. The most commonly of these are adjectives and nouns formed in a suffixal way: *l'acier / le fer chromé, sable jaune chromique, un jaune chromate franc, etc.*

The structural-semantic transformations that took place between the nineteenth and twenty-first centuries have led to the lexeme "chrome" being used in modern scientific discourse in the field of chemistry both to denote the name of the metal and as colouronym. The derived structural-semantic model "*jaune/vert de chrome*" is used in the scientific (chemical) discourse of the twenty-first century as an adjective or noun (morphological category), and as an attribute, subject or object (syntactic function). The development of chemical research on colours based on chromium has led to an expansion of the colour terminology used in this field of expertise. This is expressed in the emergence of new colouronyms that contain the lexeme "*chrome*" and which are used in the field of chemistry today: *jaune de chrome (foncé) / chrome jaune, un jaune chromate (franc), (le) jaune chromique, vert de chrome (foncé, opaque) / chrome vert, chrome rose, brun de chrome, chrome bleu-violet, chrome pur, chrôme cristallin / cristallisé, chrome neutre, chrome métallique, chrome hydraté gélatineux, chrome saturé, sel vert / violet de chrome, chrome violet, chrome blanc jaunâtre, chrome gris, chrome noir, rouge de chrome, une couleur rouge dichromate.*

The colouronym "*jaune/vert de chrome*" is also terminologized in the field of physics, where it similarly underwent structural-semantic, morphological and syntactic transformations in the nineteenth – twenty-first centuries. Up until the nineteenth century, the lexeme "*chrome*" was used in physics to denote the name of the metal. Thereafter, it started to be used as part of the structural-semantic model "*jaune/vert de*

[28] Annales de chimie et de physique: archive en ligne. 1888. 15. P. 569. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)
[29] Annales de chimie et de physique: archive en ligne. 1890. 21. P. 420. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

chrome," which is derived from this lexeme. The structural-semantic evolution of the colouronym "*jaune/vert de chrome*" in physics follows the same path that it did in the field of chemistry. This is because many of the studies on colours based on chromium belong to both disciplines, and colouronyms that include the lexeme "*chrome*" have become common terms in the physics and chemistry discursive subtypes.

The colour combination "*jaune/vert de chrome*" is used in physics as an adjective or noun (morphological category), just like it is in chemistry, and in a sentence, it can perform the syntactic function of a modifier, subject or object. For example, *"Quant au vert mixte composé de jaune de chrome et de bleu de Prusse, tout en paraissant gris, il conserve un reflet jaune-verdâtre peu agreable à l'oeil"*[30]. "*Les rayons calorifiques tombaient normalement sur des plaques de céruse, de jaune de chrome, de vert de chrome et de bleu Thénard"*[31]. These fragments are interesting because, in addition to the colouronyms "*jaune de chrome*" and "*vert de chrome*," they also contain the colour terms "*bleu de Prusse*" (Prussian blue) and "bleu Thénard" (cobalt blue). These colouronyms were originally used in chemistry, since similar colours were obtained in the process of chemical synthesis. However, starting in the latter half of the nineteenth century, the colouronyms "*bleu de Prusse*" and "*bleu Thénard*" also entered the terminology of physics due to the developments in research in this field based on chemical dyes.

In the twentieth century, the process of chemical terms transitioning into physics discourse continued, and, in addition to colouronyms, non-colour lexemes with colour semantics started to be used in physics texts, for example, the combination of a chemical term and the name of the metal "chrome" to refer to a colour substance: *"Le sesquioxyde de chrome… se présente sous deux états, l'un vert, l'autre rose violacé (poussière rose)"*[32]. What makes this example interesting is the fact that the colour term contained in it is a combination – *"le sesquioxyde de chrome"* – which denotes a colour represented in two versions: **poussière verte** (green powder) or *poussière rose violacé* (purple-pink powder). The term "*sesquioxyde*" (sesquioxide) belongs to the field of chemical discourse; however, the emergence of physics research based on chemical elements meant that the lexeme entered the terminology of that particular scientific field.

Thus, our analysis of the numerous examples taken from physics texts in the nineteenth – twenty-first centuries allows us to state that the colouronym based on "chrome" underwent a process of terminologization in physics discourse, and that this color term went through structural-semantic, morphological and syntactic evolutionary transformations similar to those that took place in chemistry discourse. The emer-

[30] Annales de chimie et de physique: archive en ligne. 1866. 8. P. 297. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[31] Annales de chimie et de physique: archive en ligne. 1887. 10. P. 391. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

[32] Annales de chimie et de physique: archive en ligne. 1910. 21. P. 242. URL: http://gallica.bnf.fr/ark:/12148/cb343780820/date (accessed 27.03.2021). (In French)

gence and development of colour studies in the fields of chemistry and physics led to the transition of chemical terms into physics discourse, which points to the interconnection of these discursive subtypes, and this process continues to develop today.

Conclusion

A number of conclusions can be drawn based on our comprehensive analysis of the use of colouronyms in various subtypes of scientific discourse.

Terminologization is a long-term evolutionary and discursive process that can be traced in French scientific discourse in the period from the nineteenth to the twenty-first centuries. Starting in the early 1800s, scientific terminology started to expand due to the emergence of new colouronyms. In scientific discourse, colouronyms arise from the names of scientific subjects and objects (the names of metals, minerals and organic products) and evolve in scientific communication in different language categories. Significant changes in colouronyms started to take place in the early nineteenth century, which can be explained by the expansion of the functional and semantic space of scientific discourse. From the structural-semantic point of view, it is important to note the emergence of colour meanings in non-colour lexemes and the development of new structural-semantic models. What is important from the morphological point of view is the increase in the number of morphological categories of colour terms: in addition to colour adjectives, colour nouns and verbs start to appear in scientific texts. From the syntactic point of view, the acquisition by colouronyms of new syntactic roles is noted. In particular, the emergence of colouronyms based on the names of scientific objects in scientific communication leads to the appearance, along with single colour lexemes, of colour phrases consisting of two or more components. The increase in the number of morphological categories and structural models leads to a variety of syntactic functions: in addition to acting as modifiers, colouronyms also perform the function of subjects, objects and predicates in sentences. From the semantic point of view, the process of semantic transformation of colouronyms that took place in the period from the nineteenth to the twenty-first centuries is particularly noteworthy. Since the early 1800s, colour terms have been used not only to describe scientific subjects, objects and phenomena, but also as an object of research themselves, possessing the semantics of a colour substance, the process of painting a colour or performing a colour action.

The example of the terminologization of colour terms allows us to trace the interconnection of various subtypes of the scientific space. Since the beginning of the nineteenth century, the terminologization of colouronyms in scientific discourse has been accompanied by a process of colour terms transitioning from one subtype of scientific discourse to another. In particular, colouronyms with a mineral etymological origin in geological discourse are also starting to move into the chemistry parlance, and terms of metallic origin, originally found in chemical discourse, are also found in physics texts. Colouronyms are used in these discursive subtypes in the same structural-semantic, morphological and syntactic categories, which indicates a commonality

of functional properties of the discursive subtypes we have studied at different linguistic levels. What is more, colouronyms are an example of terminology that is common to several discourse subtypes within a single type of discourse.

An analysis of the features of the terminologization of colouronyms allows us to note that, despite interdiscursive connections, each subtype of scientific discourse has its own characteristics, which is expressed through the semantic features of the terms used. In particular, colouronyms with a mineral etymological origin are characterized by terminology in the chemistry and geology discourse subtypes due to their semantic component, and colouronyms of metallic origin, due to their semantic features, are part of the terminology of the chemistry and physics discourse subtypes

As for further research, a comprehensive analysis of the features of the terminologization of colouronyms in other subtypes of scientific discourse, and other types of discourse in general, may yield interesting results, as could the study of new colouronyms that are relevant for modern French scientific and chemical discourse.

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