

A Comparative Analysis of Metallurgical Terms Found In The Holy Qur'an

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Abstract: This article presents a comparative linguistic analysis of metallurgical terms and metallurgy-related lexical units found in the Holy Qur'an. The study aims to identify their lexical-semantic, functional, contextual, and linguocultural characteristics and to examine their equivalents in Uzbek and other languages. Particular attention is paid to lexical units denoting metals, metal materials, molten substances, metal objects, protective equipment, and processes associated with metalworking. The analysis focuses on such Qur'anic terms and expressions as ḥadīd (حديد), nuḥās (نحاس), qīṭr (قطر), zubar al-ḥadīd (زُبُرُ الْحَدِيدِ), muhl (مُهْل), as well as lexical units associated with metal products and their functional use. The study demonstrates that these units cannot always be regarded as direct equivalents of modern metallurgical terminology. Rather, their interpretation depends on their lexical meaning, Qur'anic context, historical-cultural background, and functional role in the text. A comparative approach is therefore employed to distinguish between the historical meanings of Qur'anic lexical units and their modern technical equivalents. The study also examines semantic differentiation between metal names, descriptions of the physical state of metals, metalworking processes, metal products, and metaphorical or symbolic meanings. The findings indicate that metallurgy-related vocabulary in the Qur'anic text forms a semantically interconnected lexical field associated with material culture, craftsmanship, labor, strength, protection, wealth, adornment, and social relations. The study contributes to the investigation of historical Arabic lexicology, terminology, Qur'anic linguistics, translation studies, and the linguistic representation of ancient material culture.

Keywords: Holy Qur'an, Metallurgical Terminology, Arabic Language, Terminology, Ḥadīd, Nuḥās, Qīṭr, Iron, Copper, Metal, Lexical Unit, Semantics, Comparative Analysis, Linguocultural Studies, Historical Lexicology

1. Introduction

The Holy Qur'an is a significant source not only for religious studies but also for linguistics, history, cultural studies, and terminology. Its lexical system contains numerous concepts associated with human life, nature, labor, craftsmanship, production, trade, and various forms of professional activity. Among these lexical units are words and expressions referring to metals, their properties, metal objects, and activities associated with metalworking. Their analysis provides an opportunity to investigate the lexical richness of Qur'anic Arabic, the historical development of specialized vocabulary, and the linguistic representation of material culture.[1]

Metallurgy represents one of the oldest areas of human productive activity. Iron, copper, gold, and silver have played significant roles in economic activity, craftsmanship, military affairs, construction, and social relations. As the use of metals expanded in ancient societies, lexical units referring to metals and their practical applications became established in languages. In the Qur'anic text, lexical units such as ḥadīd (حديد, iron), nuḥās (نحاس), dhahab (ذهب, gold), and fidḍa (فضة, silver) occur in different semantic and contextual environments. They therefore deserve examination not only as names of materials but also as elements of a wider semantic and cultural system.

The Qur'anic use of metallurgy-related vocabulary is not restricted to the direct naming of physical objects. Certain metal names occur in contexts associated with wealth and property, whereas others are connected with strength, protection, labor, craftsmanship, or human benefit. In particular,

the representation of iron in the Qur'anic text demonstrates the interaction between its material characteristics and broader semantic associations with strength and benefit. Consequently, the analysis of such vocabulary requires consideration of both lexical meaning and contextual-functional meaning. The relevance of this study is determined by the need to investigate Qur'anic vocabulary from a terminology-oriented perspective while avoiding anachronistic identification of Qur'anic lexical units with modern scientific terminology. In contemporary metallurgy, specialized terminology describes processes such as smelting, casting, heat treatment, alloying, refining, and forming. The Qur'anic text, however, does not constitute a systematic modern metallurgical terminology. Its metallurgy-related vocabulary primarily reflects the lexical representation of metals, their properties, their uses, and certain metalworking activities within the historical and cultural context of the text. Therefore, a major methodological issue is to determine the degree of semantic correspondence between Qur'anic lexical units and modern metallurgical concepts. Such comparison makes it possible to distinguish between direct lexical equivalents, partial semantic correspondences, and explanatory translations. The comparative dimension of the study is also important. Comparing Arabic Qur'anic lexical units with their Uzbek, Russian, and English equivalents allows the identification of similarities and differences in lexical meaning, contextual interpretation, and translation strategies. In particular, a lexical unit may acquire a narrower, broader, or functionally different meaning when transferred into another linguistic and terminological system.[2]

Another important aspect of the research concerns the relationship between linguistic and extralinguistic factors. The formation and use of vocabulary related to metals are connected with economic development, craftsmanship, technological practices, trade, military needs, and material culture. Consequently, the historical-cultural context must be taken into account when interpreting metallurgy-related lexical units.[3]

The study also considers the possibility of metaphorical and symbolic meanings. Metal names may acquire additional semantic associations based on characteristics such as strength, durability, value, brightness, or hardness. Such associations contribute to the formation of broader concepts related to strength, wealth, adornment, labor, protection, and social relations.[4]

The aim of the study is to identify metallurgy-related lexical units in the Holy Qur'an, determine their lexical-semantic and contextual characteristics, examine their functional and linguocultural meanings, and compare them with their equivalents in Uzbek and other languages as well as with relevant concepts in modern metallurgical terminology. To achieve this aim, the following objectives were established:

1. To identify and systematize metallurgy-related lexical units occurring in the Qur'anic text;
2. To determine their lexical and semantic characteristics;
3. To analyze their meanings in specific Qur'anic contexts;
4. To examine their historical and etymological characteristics;
5. To classify the lexical units according to semantic and thematic groups;
6. To compare their Arabic meanings with Uzbek, Russian, and English translation equivalents;
7. To determine the degree of correspondence between Qur'anic lexical units and modern metallurgical concepts;
8. To identify their functional, metaphorical, and linguocultural meanings.[5]

2. Methodology

The methodological framework of the study is based on an integrated linguistic and comparative analysis of metallurgy-related vocabulary in the Qur'anic text. The research combines descriptive, semantic, contextual, comparative-typological, etymological, terminological, componential, conceptual, and translation-comparative approaches.[6]

The primary research material consists of the Arabic Qur'anic text, relevant lexical and exegetical sources, and Uzbek, Russian, and English translations. The use of several types of sources makes it possible to distinguish the lexical meaning of an Arabic unit from meanings that may emerge through translation or contextual interpretation.

The descriptive method was used to identify and characterize the formal and semantic features of the selected lexical units. Particular attention was given to their grammatical form, lexical meaning, contextual meaning, and functional role in the Qur'anic text.[7]

Semantic analysis was employed to distinguish between different types of meaning. The analysis differentiated between names of metals, descriptions of their physical states, metalworking-related processes, names of metal products, and functional or symbolic meanings. The Qur'anic context was not treated as a simple equivalent of the dictionary definition; instead, the meaning of each lexical unit was interpreted in relation to its immediate textual environment.

Contextual analysis was used to examine the semantic relationships between metallurgy-related lexical units and the words surrounding them. Verbs, adjectives, nouns, and expressions referring to processes or functions were considered in order to identify relevant semantic components such as material, metal, heating, melting, processing, construction, and finished product.[8]

A comparative-typological approach was applied to the Uzbek, Russian, and English equivalents of selected Arabic lexical units. The comparison focused on complete equivalence, partial equivalence, and explanatory translation. This approach helps identify cases in which the semantic scope of the Arabic lexical unit is either narrowed or expanded in translation.

Etymological analysis was used to examine the historical development of selected lexical units and, where relevant, their relationships with cognate forms in Semitic languages. However, etymological information was treated as supplementary evidence rather than as a substitute for contextual evidence concerning Qur'anic meaning.[9]

Terminological analysis was employed to determine the degree to which a lexical unit can be considered a specialized term. This required distinguishing between ordinary vocabulary and specialized terminology. Since some Qur'anic lexical units do not correspond to modern scientific terms in their full semantic scope, the term metallurgical terminology is used in this study in a historically and textually restricted sense.

For analytical purposes, the selected vocabulary was organized into several semantic groups:

1. Names of metals and metal materials;
2. Lexical units referring to the physical state or properties of metals;
3. Lexical units associated with metalworking processes;
4. Names of metal objects and protective equipment;
5. Lexical units associated with the functional and symbolic use of metals.

Componential analysis was also employed to identify individual semantic components such as material, hardness, color, physical state, resistance, usefulness, and functional application. The analysis determined which of these components are activated in particular Qur'anic contexts.

Translation-comparative analysis was used to examine the representation of Qur'anic metallurgy-related vocabulary in Uzbek, Russian, and English translations. The analysis considered semantic accuracy, contextual correspondence, and the possibility of semantic narrowing, broadening, or functional substitution.

A central methodological principle of the study is historical and contextual objectivity. Qur'anic lexical units were not interpreted as if they represented the complete conceptual system of modern metallurgy. Instead, their historical and contextual meanings were established first, after which their relationship with modern metallurgical concepts was examined.

The overall analytical procedure can therefore be represented as follows:

original Arabic text → context → lexical meaning → semantic classification → translation equivalent → comparison with modern metallurgical concept → comparative conclusion.

This sequence provides a methodological basis for distinguishing historical Qur'anic vocabulary from modern scientific terminology and for identifying both similarities and differences between them.[10]

3. Results and Discussion

The analysis demonstrates that metallurgy-related lexical units in the Qur'anic text constitute a relatively limited but semantically significant lexical group. They refer not only to metals themselves but also to their physical states, uses, products, and broader cultural associations.

The selected lexical units can be grouped into several major semantic categories: metal names, descriptions of physical states, metalworking-related expressions, metal products and structures, and metaphorical or symbolic uses.[11]

One of the most significant metallurgy-related lexical units in the Qur'an is ḥadīd (حديد), meaning iron. The term also occurs in the title of Sūrat al-Ḥadīd. Within the Qur'anic text, iron is represented not merely as a material substance but also in relation to strength and human benefit.

The semantic structure of ḥadīd can therefore be interpreted through the relationship:

iron → strength → benefit → human activity.

From the perspective of material culture, iron has historically been associated with tools, weapons, protective equipment, and construction. In the Qur'anic context, however, such historical associations should not be automatically equated with a modern scientific description of iron and its metallurgical properties.

The semantic potential of ḥadīd is therefore determined by the interaction between its direct lexical meaning and the contextual associations activated in particular passages.

Another significant unit is nuḥās (نحاس). The term is associated with copper or a copper-related substance and occurs in Sūrat al-Raḥmān. Its contextual environment permits interpretation in relation to a heated or molten metallic substance.[12]

From a metallurgical perspective, the concept of a metal in a molten state is associated with the transition from a solid to a liquid state under the influence of heat. However, the Qur'anic lexical unit should not be reduced to the corresponding modern technological process. Its meaning must first be established from the Arabic lexical and Qur'anic context. Thus, nuḥās demonstrates the importance of distinguishing between lexical meaning and modern technical interpretation.

The lexical unit qīṭr (قَطْر) is particularly important in the description of metal-related activity associated with Sulayman in Sūrat Saba'. It is traditionally interpreted in relevant exegetical and lexical contexts as referring to molten copper or molten metal. The term is therefore associated with the physical state of metal and with the practical use of a molten substance. From a metallurgical perspective, this provides a conceptual connection with the process of melting metal and using it for a practical purpose.

A comparison of qīṭr and nuḥās demonstrates that semantically related lexical units do not necessarily perform identical contextual functions. Their interpretation depends on the lexical tradition and the specific Qur'anic context in which they occur.[13]

The expression zubar al-ḥadīd (الْحَدِيدُ زُبُرٌ), meaning pieces or blocks of iron, occurs in the account of Dhū al-Qarnayn in Sūrat al-Kahf. The passage describes the use of pieces of iron in the construction of a barrier and subsequently refers to molten material. From the perspective of the linguistic representation of metalworking, the passage is significant because it contains a sequence of actions associated with material selection, arrangement, heating, and the use of molten metal. Nevertheless, these actions should not be interpreted as a complete description of modern metallurgical technology.

The value of the passage for the present study lies primarily in its representation of material, process, and construction concepts through lexical means.

The Qur'anic lexical field associated with metallurgy also includes words referring to products and protective equipment. The lexical unit *sarābīl* refers to garments or protective clothing and occurs in a context associated with protection. Although *sarābīl* is not itself a metallurgical term, it can be examined as part of the wider semantic field of metal products and their functional applications when the context concerns protective equipment.

Similarly, *labūs* occurs in the context of protective equipment associated with *Dāwūd*. From a terminological perspective, these units should be distinguished from direct metal names. They represent the functional-product level of the broader conceptual field rather than the name of a metal itself.[14]

Consequently, the metallurgy-related lexical field can be represented as a semantic relationship: raw material → technological process → finished product → functional use.

Within this framework, *ḥadīd* represents a metal material, *qīṭr* and *nuḥās* are associated with metal or its physical state, *zubar al-ḥadīd* represents material pieces, while *labūs* and *sarābīl* are associated with the functional application of protective products.

Comparison of the Arabic lexical units with their Uzbek, Russian, and English equivalents demonstrates that translation equivalence is not always absolute. Some Arabic units have relatively stable equivalents, whereas others require contextual interpretation. For example, *ḥadīd* is normally represented by the Uzbek equivalent *temir* ("iron"), which provides a relatively direct lexical correspondence. By contrast, units such as *qīṭr* and *nuḥās* may involve greater interpretive variation because their semantic scope depends on lexical tradition, exegetical interpretation, and Qur'anic context.

Accordingly, translation analysis should not be restricted to dictionary equivalence. Three levels should be distinguished:

1. Lexical equivalence;
2. Contextual equivalence;
3. Functional and cultural equivalence.

This distinction is particularly important for religious texts because a translation may preserve the basic denotative meaning while modifying part of the semantic or cultural information carried by the source-language unit.

The comparative analysis also indicates that translation may involve semantic narrowing, broadening, or functional substitution. A specific metal may be rendered by a more general term such as "metal," whereas a broader source-language expression may sometimes be translated by a more specific term. Therefore, the translation of Qur'anic metallurgy-related vocabulary requires simultaneous consideration of lexical meaning, context, terminology, and cultural background.

The findings demonstrate that metallurgy-related vocabulary in the Qur'an combines terminological and broader semantic functions. The lexical units refer to material objects and processes while also participating in wider conceptual structures associated with strength, protection, labor, wealth, adornment, and human benefit.

At the same time, the findings emphasize the need for methodological caution. Modern metallurgical terminology includes highly specialized concepts such as alloying, heat treatment, metallurgical furnaces, refining, rolling, casting, and other technological processes. These concepts should not automatically be projected onto Qur'anic vocabulary.

The Qur'anic lexical units primarily represent concepts available within the historical and cultural context of the text. Their comparison with modern metallurgical terminology is therefore useful as a semantic and conceptual comparison rather than as evidence that the Qur'an contains a systematic

modern scientific terminology.

This distinction is essential for avoiding anachronistic interpretations. The analytical procedure adopted in the present study therefore establishes the Qur'anic lexical meaning first and subsequently examines its relationship with modern scientific terminology.

The study further demonstrates that the metallurgy-related vocabulary forms a semantic field rather than a collection of isolated lexical items. The field can be conceptualized as follows:

material → physical state → processing → product → function → cultural association.

Such organization makes it possible to examine metallurgy-related vocabulary simultaneously from lexical-semantic, terminological, historical, and linguocultural perspectives.[15]

4. Conclusion

The comparative analysis demonstrates that metallurgy-related lexical units in the Holy Qur'an possess significant lexical-semantic, functional, historical, and linguocultural characteristics. They refer to metals and metal-related materials, physical states, material pieces, products, protective equipment, and activities associated with the use and processing of metals. The analysis of ḥadīd, nuḥās, qitr, zubar al-ḥadīd, and related lexical units shows that their meanings cannot always be directly equated with modern metallurgical terminology. Their interpretation depends on the interaction of lexical meaning, Qur'anic context, historical-cultural background, and translation practice. The study also demonstrates that metallurgy-related vocabulary has a multidimensional semantic structure. Metal names may function as direct references to material substances while also participating in broader conceptual associations with strength, benefit, protection, labor, wealth, and adornment. The comparison of Arabic lexical units with their Uzbek, Russian, and English equivalents reveals that complete lexical equivalence is not always possible. In particular, certain terms require contextual or explanatory translation. Consequently, the translation of Qur'anic metallurgy-related vocabulary should take into account not only dictionary meaning but also contextual, functional, and cultural-semantic correspondence. A further finding concerns the distinction between historical Qur'anic vocabulary and modern scientific terminology. The Qur'anic text should not be interpreted as a systematic representation of modern metallurgical science. Instead, its metallurgy-related vocabulary provides valuable linguistic evidence concerning the representation of metals, material culture, craftsmanship, protection, and human use of materials within the historical context of the text.

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