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Measuring the Specific weight of minerals in Arab-Islamic scientific heritage.

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The classification of minerals by Muslim scholars based on the likeness of the physical aspects started early. Among the physical properties considered to differentiate the minerals, we mention the specific weight corresponding to a capital property to decide distinctions between minerals whose other physical properties are similar.

This may really be the most important property developed by Arab-Muslim mineralogy, in practical and experimental in design.

The concept of specific weight, determined by Al Kindi Al Bayrouni and Dimachqui…, coincides perfectly with its definition as currently adopted.

Although Muslim scholars knew and measured the specific weight of minerals long before the European scientists (interested in this property, from the 17th century); their results were more accurate.

The fight against fraud and camouflage, made by cheaters in gold and silver, and the counterfeiting of a few cheap stones in place of valuable jewelry, was one of the most important reasons that prompted Muslim mineralogists to engage in such investigations.

If Archimedes laws in the float and the disposal of bodies and the problems of Euclid and Malanaus... had represented the physical and mathematical foundations that inspired Muslim scholars to calculate and measure specific weight objects. It should be emphasized that the Muslims' contribution had represented a huge leap in this area, both in theory and practice; in fact they developed many mathematical methods to calculate the specific weights of liquid and solid bodies. They also invented and developed a lot of devices and apparatuses to perform highly accurate measurements.

Al Bayrouni and Al Khazen are among the most prominent Muslim scholars that left their marks in the field of computing and measuring specific weight of minerals and metals. In this paper, we will limit ourselves to speak of the accomplishments of these two giants of applied sciences in the Islamic civilization: we will refer to the definition of measuring instruments they designed (The côniforme device of Al Bayrouni and the Balance of Wisdom of Al Khazen); and we will expose the main results they have achieved, highlighting the scientific value of the results.

The comparison between the values of the specific weight of the fifty minerals and metals that Muslim scholars have measured and the values of the measurements made by modern means, shows that the numbers are almost identical, with very slight differences (increasing or decreasing), within few hundredths or tenths, except in very rare cases.

Muslim scholars were the first to use the specific weight for qualifying minerals and metals. This provided a great boost to the development of mineralogy, having emerged from the descriptive study in quantitative study based on precise figures. This has greatly contributed to the development of both theoretical and practical aspects of mineralogy.