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Title

Rare Earths: the Yellow Vests of the Periodic Table.

Abstract

In 1869, a 35-year-old Russian chemist, Dmitri Ivanovich Mendeleev, with (i) a multilingual communication facility, (ii) a desire for unusual recognition and (iii) the physical appearance of a passionate scientist proposes a classification of the chemical elements according to their increasing equivalent masses. Besides the latter concept, after all not very innovative even in 1869, Mendeleev tried to group the elements by periodic properties and thus managed to construct a two-dimensional table possessing two series of eight groups that incorporates all known elements at that time (about 80% of the natural elements), except for three undesirable elements which resist all attempts at classification: didymium, terbium and erbium.

The latter were therefore considered inadequate and irrelevant because they did not fit well-accepted criteria fixed by an elite, a trend which mirrors other historical movements and, as we now know, eventually leaves traces...

During the 48 years separating the first publication of the periodic table in 1869 and Mendeleev's death in 1907, nine new elements found successfully their places within the periodic table, but the abandoned rare earths, or 'yellow vests' of the periodic table, simultaneously grew during the same period and reached the non-negligible number of twelve!

The origin of Mendeleev's nightmare and the various 'patches' found by chemists over time to remedy it will be discussed, as well as the modern place occupied by these cursed rare earths in our technological society.

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