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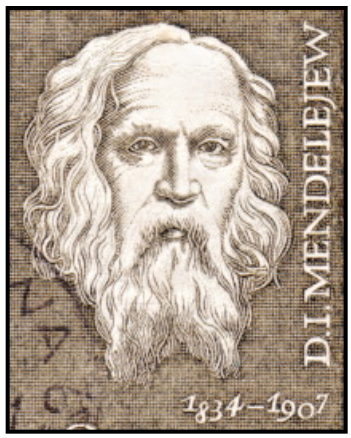
Mendeleev and His Periodic Table

Lexile 970L



1 Russian chemist Dmitri Mendeleev realized the need for scientists to be able to know an element's identity quickly and efficiently. Although earlier scientists had organized elements, their tables did not satisfy Mendeleev. He felt they had left out important information.

2 Early in his studies, Mendeleev saw patterns in the chemical and physical properties of some elements. He grouped the elements into a neat, logical manner according to these patterns. He developed the Periodic Table of Elements in 1869. This table arranged elements according to increasing atomic mass. Groups of elements which have similar physical and chemical properties are arranged into rows and columns.

3 The table later proved to be a bit flawed, but Mendeleev expected this. He left some blank spots on his table for undiscovered elements. These were, indeed, later discovered. His table also did not consider the importance of protons, which had not yet been identified. Protons are important in grouping elements since they strongly influence the physical and chemical properties of elements. The table also did not take into account the noble gases, which do not have properties like those near them on the table.

4 Today's Periodic Table looks much like Mendeleev's table of 130 years ago. More elements have been identified and classified. The inert gases now have been placed on the table. The table now is arranged according to increasing atomic number, showing each element's physical and chemical properties, rather than according to atomic mass, as Mendeleev's did. The Periodic Table of Elements remains a valuable tool for chemists and other scientists.

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1 Mendeleev organized his Periodic Table by _____ in the same way that today's Periodic Table is organized by atomic number.

A protons

B neutrons

C atomic mass

D atomic number

2 The modern Periodic Table is different from Mendeleev's in several ways. In which way are the two tables the same?

A The inert gases occupy one column of the table.

B Elements are arranged by increasing atomic number.

C There are blank spots in the middle for undiscovered elements.

D Elements are put into columns based on similar chemical properties.

3 Mendeleev's Periodic Table lacked _____.

A noble gases

B chemical property trends

C neutrons

D atomic mass

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4 How does the Periodic Table used today classify elements?

A according to chemical properties alone

B according to atomic number

C according to atomic mass

D according to radioactive properties

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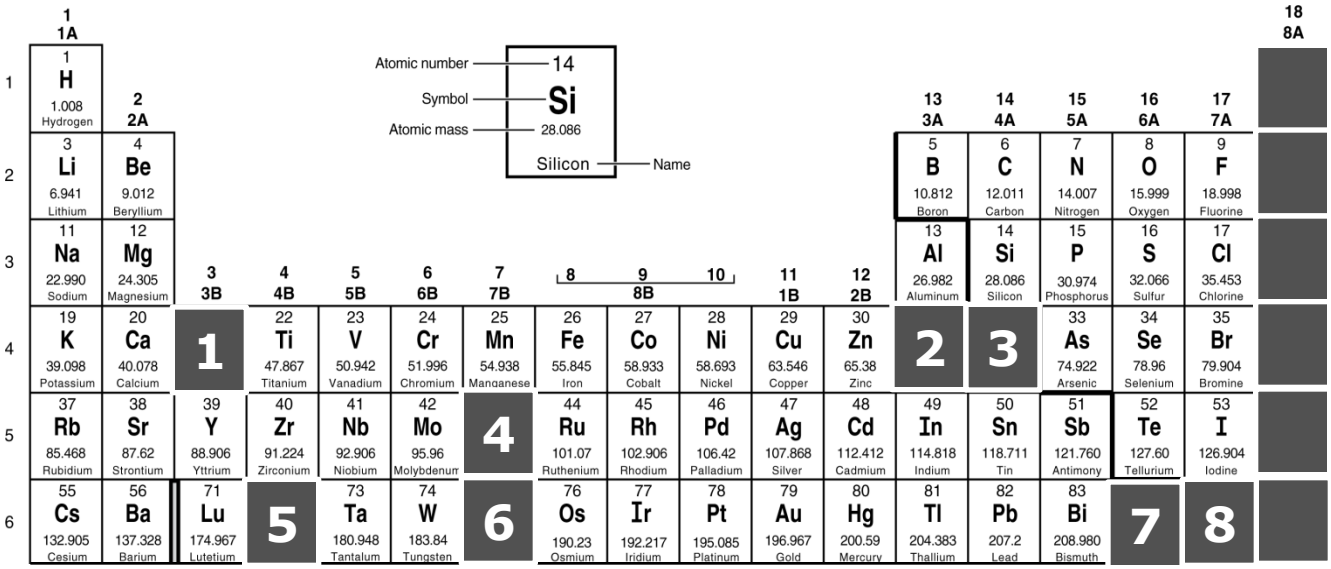

5 The diagram shows a portion of the Periodic Table. Elements which were unknown during Mendeleev's time have been removed. Using Mendeleev's rules for arranging elements, which box would contain the metal gallium, which has an atomic number of 31 and an atomic mass of 70?

A Box 5

B either Box 2 or Box 3

C only Box 2

D only Box 3