

POSITION IN THE PERIODIC TABLE

The d-block segment of the periodic table encompasses elements from group 3 to 12, wherein the d orbitals undergo progressive filling across each of the four extended periods. The designation "transition" attributed to these elements within the d-block primarily arises from their intermediary placement between the s-block and p-block elements. Within the d-block, there exist four distinct series of transition metals: the 3d series (ranging from Scandium to Zinc), the 4d series (spanning from Yttrium to Cadmium), the 5d series (from Lanthanum and Hafnium to Mercury), and finally the 6d series (extending from Actinium, Unq to Ununbium).

Definition of Transition Elements

A transition element is characterized by the presence of incompletely filled d orbitals either in its ground state or in at least one of its oxidation states. Notably, elements such as Zinc (Zn), Cadmium (Cd), and Mercury (Hg) do not fit the typical definition of transition elements due to their d10 configuration being fully occupied in both their ground state and common oxidation states.

Despite this deviation, given that they represent the final members of their respective transition series, they are included in the study of transition metals' chemistry.

The examination of transition elements and their compounds stands apart from that of main group elements due to the distinctive feature of having partially filled d orbitals within their atomic structures.