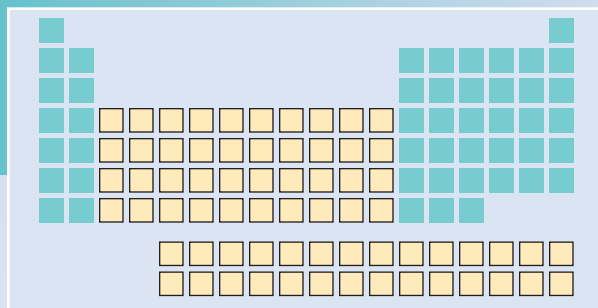


GROUPS 3–12 TRANSITION METALS

CHARACTERISTICS

- consist of metals in Groups 3 through 12
- contain one or two electrons in their outermost energy level
- are usually harder and more brittle than metals in Groups 1 and 2
- have higher melting and boiling points than metals in Groups 1 and 2
- are good heat and electrical conductors
- are malleable and ductile
- have a silvery luster, except copper and gold
- include radioactive elements with numbers 89 through 112
- include mercury, the only liquid metal at room temperature
- have chemical properties that differ from each other
- tend to have two or more common oxidation states
- often form colored compounds
- may form complex ions



Iron ore is obtained from surface mines. Hematite, Fe_2O_3 , is the most common iron ore.



Copper ores are also obtained from surface mines. Copper ore is shown here.



Gold, silver, platinum, palladium, iridium, rhodium, ruthenium, and osmium are sometimes referred to as the noble metals because they are not very reactive. These metals are found in coins, jewelry, and metal sculptures.