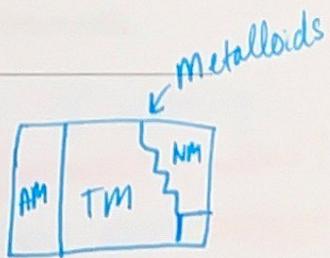


Key

Session 11 - Transition Metals

- 1) Which side of the periodic table consists of nonmetals?

the upper right-hand corner
& hydrogen



- 2) Where would you find metalloids?

Along the line that splits metals from nonmetals

- 3) Where are the active metals?

In the first 2 rows of the periodic table. They are the ones with only an s orbital in their valence shell

- 4) How are transition metals defined?

They are elements that readily form compounds with partially filled d- or f- orbitals

- 5) Which elements have a higher electronegativity?

Nonmetals

- 6) What are some properties of transition metals?

They have multiple oxidation states (Fe^{2+} or Fe^{3+}), form colored compounds, conductivity, & flexibility (malleable = hammered into shape, ductile = drawn into wires)

Apr. 12, 2021

Apr. 20, 2020 —

Page 2

- 7) What types of elements form ionic and covalent bonds? How does this differ from metallic bonding?

- Ionic bonds are formed from elements of opposing charges (opposite ends of the table) [nonmetal + metal]
- Covalent bonds are formed when electrons are ~~are~~ SHARED in specific bonds (typically b/w nonmetals)
- Metallic bonds are formed from packed atoms, the electrons are shared, but they are shared throughout rather than in specific bonds (electron sea)

- 8) What is a mineral?

Naturally occurring solid inorganic compound

- 9) What is an ore?

A type of mineral that is an economically useful source of metal

- 10) What is metallurgy?

The science & technology of extracting metals from their ores & preparing them for use

- 11) What are the five steps of metallurgy that were discussed?

Mining, preliminary treatment (concentrating), smelting (reducing metal), refining (purifying) & alloying (combining 2 or more metals)

- 12) What do transition metals with lower oxidation states produce?

Simple ions, like Ag^+ or Fe^{2+}

13) What do transition metals with higher oxidation states produce?

Covalent compounds or polyatomic ions,
like MnO_4^- or Cr_2O_7^-

14) What are coordination compounds?

Compounds that contain a central metal
or ion surrounded by ligands (electron-pair donating
species)

15) Are coordination compounds cationic or anionic?

They can be either or even neutral

16) What is the difference between monodentate and bidentate ligands?

Monodentate ligands only have one donor atom &
bidentate ligands have 2 donor atoms. You can
also have polydentate ($2+$)

17) What charge would you find on ligands?

Either a negative (anionic) or neutral charge

18) What is the coordination number?

The # of bonds formed by the central
atom (the smallest possible # is 2).