

Chemical Bonding— Demonstration Summaries and Concepts



Go Fish for an Ion—A Chemistry Card Game

“Go fish!” in the fishing pond of ion cards! Have fun while reviewing the names and charges of common ions and the formulas of ionic compounds with this engaging chemistry card game. All students are actively involved as they form compounds using ion cards for 20 different cations and anions, review matches made by other players, and keep detailed score sheets. Completed score sheets make perfect study guides when it’s time to prepare for the test.

Electronegativity—A Simple Demonstration Device

Teachers at all levels appreciate the effectiveness of concrete models to teach students about abstract concepts. Help students visualize the origin and nature of electronegativity using this inexpensive and easy-to-make demonstration device. Rubber bands and Styrofoam® spheres demonstrate the tug-of-war between atoms for the bonding pair of electrons in nonpolar and polar covalent bonds.

Splatter Test—Properties of Liquids Demonstration

The properties of liquids reflect the bonding within molecules and the nature and strength of forces between molecules. The “Splatter Test” demonstration will leave your students with a lasting impression of how intermolecular forces between molecules affect the rate of evaporation of a liquid.

Graphite Disk Demonstration—Face-up or Face-down?

Paper and graphite (pencil lead) have very different properties. Place graphite-coated paper disks in two-phase solvent systems containing water and a nonpolar organic solvent and observe the orientation of the disks—face-up or face-down? Will it be random? Always up or always down? Find out with this unique demonstration.

Properties of Metals—Crystal Structure and Heat Treatment

Heat treatment of metals is used to increase their hardness and improve their “workability”—their ability to be bent and shaped. Annealing, hardening, and tempering produce remarkable changes in the properties of metals. Discover the effects of heating and cooling metals and correlate the changes with models of crystal structure with this interesting “bobby pin” activity.

Super Duper Polymer—Polyethylene Oxide Demonstration

Hydrogen bonding produces gravity-defying special effects in this classic demonstration of the properties of a unique polymer. Principles of bonding and structure become large enough to see if you make the molecules big enough!

Concepts

- Ionic compounds
- Empirical formulas
- Cations and anions
- Ion charges

- Covalent bonding
- Nonpolar vs. polar bonds
- Electronegativity
- Bonding electron pair

- Intermolecular forces
- Hydrogen bonding
- Dipole–dipole interactions

- Covalent bonds
- Polar vs. nonpolar compounds
- Density

- Properties of metals
- Crystal structure
- Body-centered cubic
- Face-centered cubic

- Polymers
- Hydrogen bonding
- Bond lengths and bond angles