



CARBOCATION (CARBENIUM ION) BADGE

An empty p-orbital on a carbon, waiting to embrace some electrons. A carbocation is any even electron cation with significant partial positive charge on a carbon atom (IUPAC). This badge is represented by a carbenium ion (R_3C^+), displaying trigonal planar geometry with a positive charge symbol on carbon.

One electron cloud for all, and all for one! True aromatic molecules are characterized by their cyclic, planar, and fully conjugated properties. Aromatics always obey the $4n + 2$ pi-electron rule. Benzene, the poster child for aromaticity, represents this badge.

AROMATICITY BADGE



NEWMAN PROJECTION BADGE

Another point of view can make all the difference. The Newman projection provides a line of sight down the C-C bond of a molecule. A new conformation is achieved when substituents rotate around the C-C single bond. This badge can rotate between eclipsed and staggered conformations.

Don't rock the boat or it might flip over. Cyclohexane, a classic organic molecule, occupies several conformers. The most common conformation students will draw is the chair conformation, but they will also draw the boat, and twist boat. This badge is permanently stuck in the most stable conformer of cyclohexane.

CHAIR CONFORMATION BADGE



STEREOCHEMISTRY BADGE

Chemistry (and life) are better in three dimensions. Stereochemistry has a profound influence not only on structure but reactivity. Organic chemists routinely identify whether a stereogenic center is in the R or S configuration. First step towards earning this badge is by identifying if it is in the R or S configuration.

Spin right round, right round, let it relax down, let it relax down, down. The nuclear spin of an atom is one of the quantum properties closely associated with Nuclear Magnetic Resonance (NMR) spectroscopy. Learning the theory will enhance a student's understanding of NMR. This badge is best worn slightly tilted.

NUCLEAR SPIN BADGE



CARBONYL BADGE

Variety is the spice of life (and carbonyls). Aldehydes, ketones, esters, amides, and carboxylic acid functional groups (FG) all contain a carbonyl. With that many FG under one roof, it is understandable why carbonyl chemistry is a fundamental topic in organic chemistry. The badge displays a C=O moiety.

You gotta move it, move it. Molecules are hyperactive and can never stop shaking and wiggling. Students learn how to take advantage of this property to identify specific chemical bonds using Infrared (IR) spectroscopy. This badge is represented by two atoms connected by a spring.

VIBRATIONAL STRETCH BADGE



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