

Getting Ready for Organic Chemistry

Which of the topics covered in General Chemistry form major parts of the foundation you need to succeed in Organic Chemistry?

Here are the "big four" in order from most to least important.

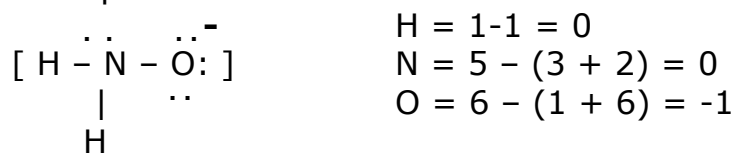
1. Lewis Structures

Organic Chemistry is virtually *all* about structure. I often say that organic chemists can draw Lewis structures in their sleep. It would be great for you to get to that point, too! The good news: almost all organic structures obey the octet rule. Don't forget: the elements B, C, N, O and F can *never* exceed an octet in a structure!

The concept of resonance is very important in o-chem. If you've forgotten this or had trouble with it, it would be useful to review it. Also make sure that you're clear on how to determine the formal charges on atoms from structures. The quick-and-easy way is:

Formal charge = group number - (dashes + dots) (using the older 1 through 8 group numbers)

Example:



It's that simple! Don't let anyone try to convince you that it's more complicated than that.

2. Molecular Geometry and Polarity

Molecules are three-dimensional objects, and organic reactions are all about these objects bumping into each other and interacting when they do. My experience tells me that those who can visualize these objects in three dimensions have a definite advantage over others in grasping the subject. To give yourself a fighting chance, review VSEPR theory and get a good molecular model kit (You can buy used ones online!). Practice constructing models so that you can build them quickly and accurately. I think you'll find that being able to hold the molecules in your hand and look at them from



various angles will be helpful in understanding many aspects of organic chemistry.

3. Acid-Base Theory

Many of the steps in the mechanisms of organic reactions involve proton (H^+) transfer, which of course relates to the Brønsted-Lowry definitions of acids and bases. Be sure that you can draw the structure of the conjugate acid and conjugate base of any species (where they exist), and be able to predict whether or not they do exist! Remember: any species that contains hydrogen can act as a Brønsted-Lowry acid; any species that has an unshared electron pair or a π -bond can act as a Brønsted-Lowry base.

Most of the other steps in organic mechanisms can be understood in terms of the Lewis definitions of acids and bases, so it's a good idea to be clear about those also before you tackle this course.

4. Kinetics and Reaction Mechanisms

For most students some of the most difficult problems in organic chemistry are those that deal with reaction mechanisms, which fall under the general heading of Chemical Kinetics. All general chemistry sequences include this subject, but most of what is usually covered is not particularly relevant to organic chemistry. The most important topic is using a rate law to predict a reaction mechanism. Be sure that you understand what an elementary reaction is, what the rate law tells you about the "molecularity" of the rate-determining step, and that each step in a mechanism must be an elementary reaction.

