

Build Your Own Molecule

Student Activity

Introduction and Historical Context

In 1897, Felix Hoffmann and Arthur Eichengrün took apart molecules of salicylic acid and acetic anhydride, then put their atoms back together to make molecules of acetylsalicylic acid, otherwise known as our friend aspirin.

Now we're going to give you a chance to play Felix Hoffmann and build your own molecules, or at least models of molecules. Your challenge is to put together a molecule of your own design. Be creative!

Materials

- Molecular modeling kit

Procedure

1. Using the modeling kit provided by your teacher and any restrictions that he or she has set, put together your molecule.
2. Once your molecule is approved, write down its molecular formula.
3. Figure out the name of your molecule. There are rules for naming molecules based on their molecular structures.
4. Draw the molecule.
5. Once you know the name, molecular formula, and structure of the molecule, use the library or Internet to answer the questions below.

Post-Lab Questions

1. Does your molecule exist in real life?
2. If your answer is "yes," then answer the following questions. If your answer is "no," then find a molecule with a structure similar to the one you built, that does exist in real life. Then answer the following questions about the real-life molecule.
3. Does your molecule have any other names than the one you derived for it?
4. What is your molecule used for?
5. Is your molecule found in nature? If so, where?
6. If your molecule is not found in nature, from what materials is it made?
7. At room temperature, is your molecule a solid, liquid, or gas?
8. What is its melting point?
9. What is its boiling point?
10. Can you point to atoms or an arrangement of atoms in your molecule that gives it its properties or that makes the molecule useful?
11. Can you buy your molecule from a chemical supply catalog? If so, how much would 1 kg cost?
12. Is your molecule toxic? If so, how much of it would you need to kill an adult rhinoceros? Hint: the rhinoceros weighs 2000 kg.