Transcript
Carbohydrates

A few introductory words of explanation about this transcript.

This transcript includes the words sent to the narrator for inclusion in the latest version of the associated video. Occasionally, the narrator changes a few words on the fly in order to improve the flow. It is written in a manner that suggests to the narrator where emphasis and pauses might go, so it is not intended to be grammatically correct.

The Scene numbers are left in this transcript although they are not necessarily observable by watching the video.

There will also be occasional passages in blue that are NOT in the video but that might be useful corollary information.

There may be occasional figures that suggest what might be on the screen at that time.

103 TableSecrets

Learning the secrets of the periodic table is a lot like learning English…right when you think you've got it, you get run over by the exceptions. However, here is a secret everyone should know. This rightmost column in the table has no great urge to make bonds with other atoms. The column to its left wants to make one bond, the second column from the right wants to make two bonds, third column atoms want to make three bonds, and so on.

So hydrogen – in the first column from the right -- wants to make just one bond. In H2 gas, hydrogen makes its one bond with another hydrogen atom, making them both happy. Another example is water. We can see that Oxygen wants to make two bonds because it is in the second column from the right. So it can get together with two hydrogen atoms which each want to make one bond…and all three atoms are happy.

Now there can be double bonds as well. Since Oxygen wants to make two bonds, it can get together with another oxygen atom in a way that uses BOTH available bondings. This oxygen molecule satisfies the bonding urge of both atoms and the resulting double-bond is very strong.

Nitrogen forms triple bonds with other nitrogen atoms to make N2 gaseous nitrogen. The trivalent nitrogen bond is one of the strongest molecular bonds known.

105 Carbs

Now this carbon atom wants to make four bonds, and it is pretty versatile about how it does this. Let's give it a double bond with oxygen, satisfying the oxygen desire for two bonds. And let's give it one hydrogen… that's a total of three bonds for the carbon…it still wants another. So let's give it another carbon for its fourth bond.

But now we have need of three more bonds for the new carbon. So we stick hydrogen on one side and a single bond to an OH molecule on the other. Now this NEW carbon wants another bond, so we give **IT** a third carbon and keep going. After a total of six carbon atoms, let's end it by adding two hydrogen atoms and an OH molecule…like this.

This molecule is a molecule of glucose – simple sugar. And in addition to having this chain structure, it can loop on itself and form a ring like this. Notice that the middle carbons are each attached to the atoms that form water – H2O.

All carbon chains and rings with middle carbon atoms attached to hydrate groups like this are called carbo-hydrates.

Sugars, starches, fibers, grains, cellulose are carbohydrates. Breads, pastas, bran, potatoes, rice, corn, wheat, cereals, fruits, and vegetables are all primarily carbohydrates.