Types of Isomers

Transcript

Instructor: Jessica

00:00:00:00 - 00:00:21:88
Instructor: Hey, everyone. Today, we are going to be starting our talk about stereoisomers. So before we even get going, you need to know exactly how to determine chirality. If you don't know the difference between RNS, go back to the last video done by Tallis, and she'll get you set up. So once you're done that, come back, and we'll be ready to go.

00:00:21:88 - 00:01:05:81
Instructor: So we're gonna be talking about two types of stereoisomers. So we're gonna be talking about Enantiomers and diastereomers. So specifically, the differences between the two of them, starting with Enantiomers So within Enantiomers, you're going to find that every chiral center will change. So first, you have to be able to pick out each chiral center and label it as RNS as you learned in the previous video. And then in the other molecule, you'll do the exact same thing, and you'll have to compare the two.

00:01:05:81 - 00:01:49:89
Instructor: And if every chiral center changes, that's your Enantiomers. But if not every chiral center changes, then that'll be your diastereomer. In that case, it could be one chiral center that changes or it could be everything except for one chiral center that changes, and that is still a diastereomer. So just going to write that out so you guys don't forget for later. So that right there is what we like to call the brute force way of determining your Enantiomers and diastereomers.

00:01:49:89 - 00:02:43:15
Instructor: What you can also do is just determine them by inspection. So when we are looking at our molecule and we have our three D way of drawing out our structure, you'll be able to tell if your larger atom is coming into the plane or out of the plane, and from that, you can just say, Oh, wow. If it's coming out of the plane here and it's coming into the plane there and it's the mirror image, they're the same. We'll do a couple examples just to make sure you guys see that through. So we can see here we have three chiral centers on each molecule.

00:02:43:15 - 00:03:13:51
Instructor: The first thing that we want to do is find our three chairl centers. What you'll do at home is label each one of these Chiral centers as R and S. Then you're going to compare what are they on this one versus what are they on this one. I want you to pause the video at home. I want you to label those out and then come back for the answer.

00:03:16:40 - 00:04:00:48
Instructor: So now that you unpause the video, you can see here that all of these are R. And then all of these are S. So you can see from our earlier definition, every chiral center changes. Now, that we see changes from R to S, but we could also have done it by inspection instead of labeling each one as R&S because of Sub, Oh, this looks like an exact mirror image, and that would also be a good way to determine if it's Enatiomer. And now we can move on to example number two.

00:04:00:48 - 00:04:40:63
Instructor: And now you can look at these two molecules, and you want to find the chiral centers. I want you to pause the video, find your chiral centers, label them as RNS, and then come back. Now that you're back, we have a Chiral center here, a Chiral center here, or a right here, and one right here. You'll know that this one is R. This one is S, and then both of our ones over here are S. So you'll see

00:04:40:63 - 00:05:14:55
Instructor: that not every chiral center changed between these two molecules, and that means that it's a diasteremor because we still had this one that changed. So now we can move on to example number three, and this one's going to have a lot of writing at home for you guys. So make sure you have a pen and paper ready. So for example number three here, I'm going to draw you out a molecule, and then it's going to be your job to then draw the enantiomer. So I'm going to draw it out, give you a couple seconds, and then show you the answer.

00:05:20:43 - 00:05:50:12
Instructor: There you are. Now I want you to pause the video, get out your pen and paper and draw the Enantiomer of this molecule. And now here's the answer. Now, if you didn't quite get this right, I'll show you how to get to the correct answer. So the first thing I did, I found each chiral center.

00:05:50:12 - 00:06:15:46
Instructor: I know that they're chiral because as you saw in the last video, they each have different R groups coming off of it. So knowing that, I can flip each of those Chiral centers into the other chirality. So in this one, it's coming out of the page, so I can go into the page. In this one, it's again coming out of the page. I can put it into the page.

00:06:15:46 - 00:06:46:49
Instructor: This one is going into the page so I can flip it to out of the page. Now, if you instead did it as a mirror image, I can show you that answer as well. And there you are. That

is the way that you can get to the Enantiomer of your starting molecule. And now you are an expert between enantiomers and diastereomers, and you are ready for your next organic chemistry midterm.