

Stereochemistry #1: Chirality and Assigning R & S

Give yourselves a pat on the backs: You made it through all of the alkane videos/worksheets! But we're on to the next one, and we're diving straight into stereochemistry, which I swear is not that bad, as long as you have solid fundamentals (which we will nail down). This worksheet will cover the basics: identifying chirality (or "handedness" as we discussed in the video) and assigning basic R & S to stereocenters within molecules.

1.) Given the molecules below, indicate whether or not the molecule is chiral. If it is not chiral, explain why—you got this:

i.)

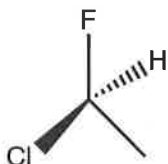


- Not attached to 4 different things

(Not chiral)

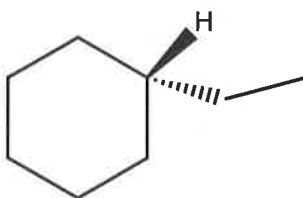
Achiral

ii.)



Chiral

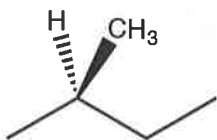
iii.)



- Not attached to 4 different things

Achiral

iv.)



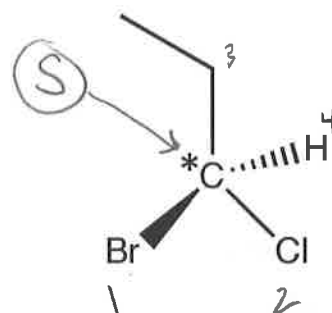
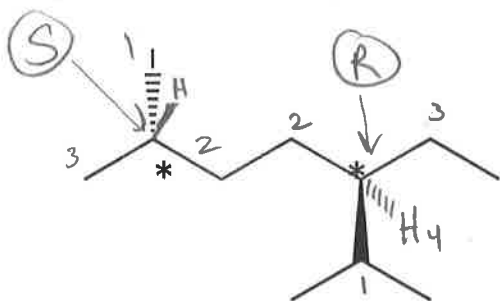
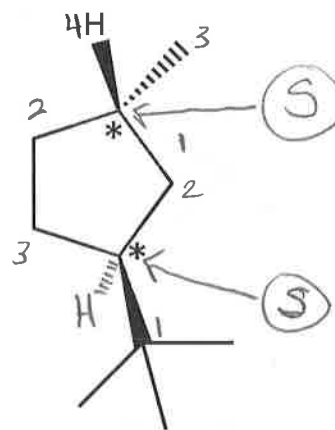
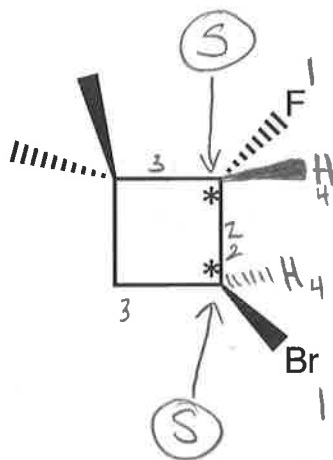
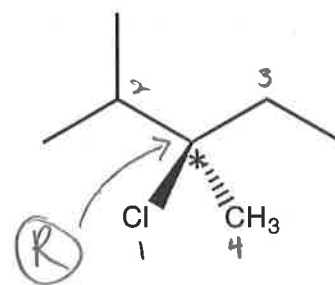
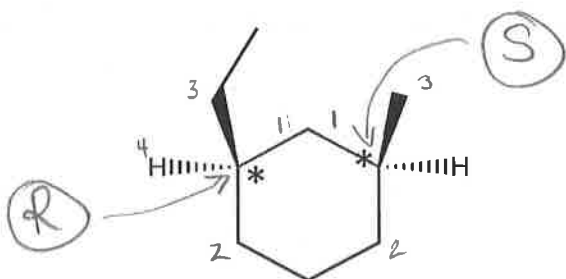
(Attached to 2 CH_3 groups)

Achiral

- Not attached to 4 different things

2.) Okay, good job. Now that we've figured out how to determine whether or not a molecule is chiral. Let's tackle some R & S.

Remember the rules; we assign R & S to stereocenters, atoms attached to 4 different groups. We assign the groups numbers 1-4 (one being the heaviest, highest priority group), and we ideally want the lowest priority group (group assigned #4) to be dashed (facing away from us). To focus on assigning R & S, I've starred all of the stereocenters for you; you just have to correctly label R or S.



3.) As you can see, it's a little simpler when the lowest priority group is facing away from you (straight up apply R & S) or when it is facing towards you (assign R & S, then realize it is the opposite). To round out this worksheet, we're going to assign a little more R & S, but you'll have to use the Double Switch we talked about in the video lesson to move the lowest priority group in a position facing away from you.

