USING YOUR HEAD AND HANDS TO DETERMINE R AND S CONFIGURATION

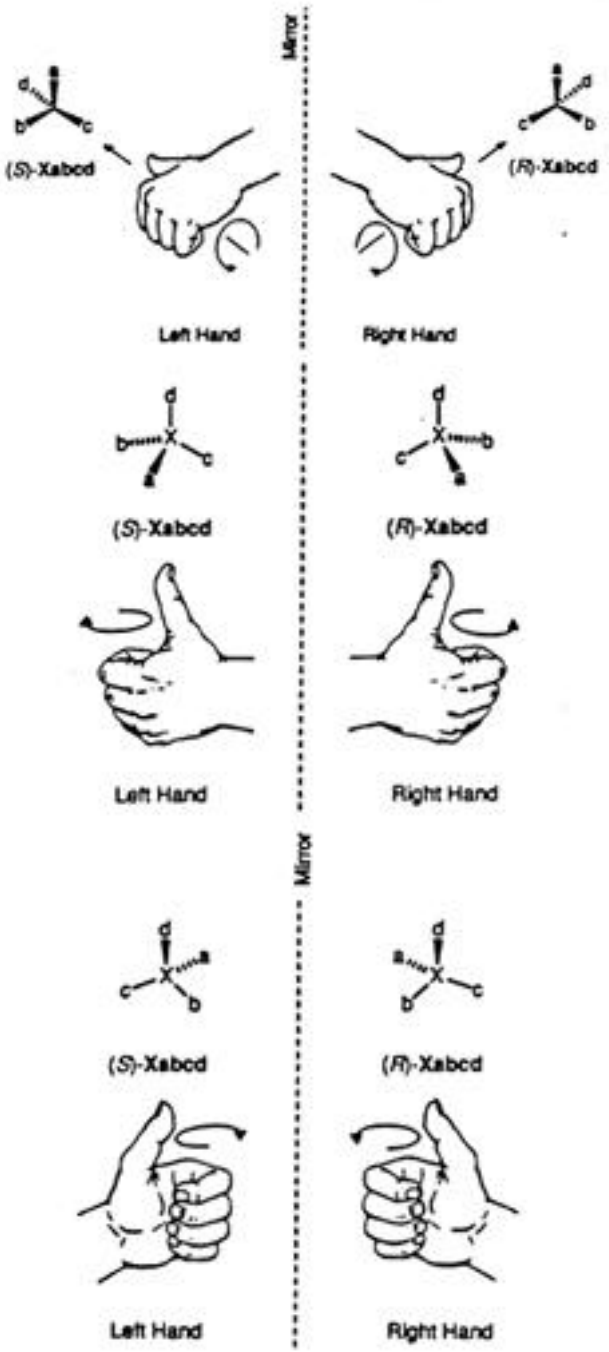
First identify the chiral centers in the molecule of interest.

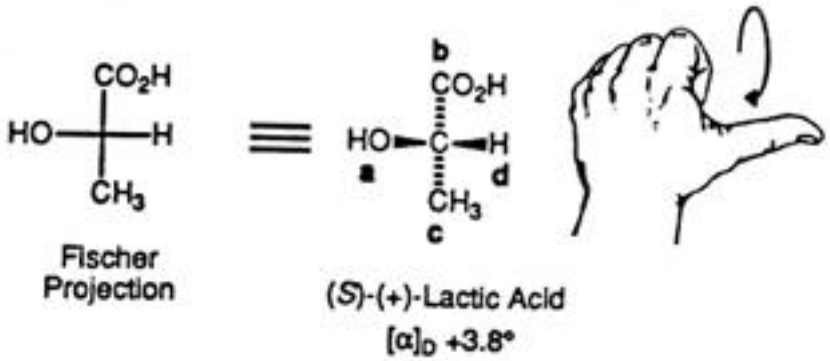
Then, using the Priority Rules (Cahn, Ingold and Prelog), establish the relative stereochemical priorities of the four groups attached to the chiral center of interest, which we will call X (of course it is usually a carbon). The substituents we'll call a,b,c,d, in order of decreasing priority.

Without redrawing or otherwise manipulating the drawing:

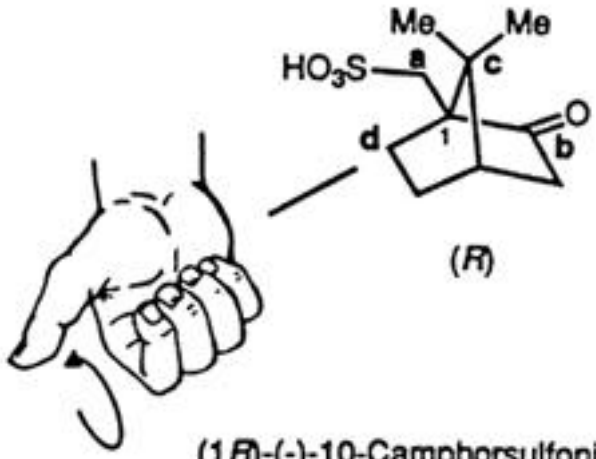
1. Orient your right hand so that your thumb points from the chiral center X toward the lowest priority atom d along the Xd bond.
2. Try to curl the fingers of your right hand in the direction of decreasing substituent priority; you can use any ordered pair of substituents a-b, b-c (or even c-a). If you can curl your fingers in this way, the configuration of the chiral center is ***(R).*** Double check with another ordered pair of substituents.
3. If you cannot curl the fingers of your right hand from a to b, or b to c, try the whole process again with your left hand. Align your thumb so that it points from X to the lowest priority atom d, then try to curl your fingers in order of decreasing priority, e.g. from a to b. If you can do so with the left hand, the configuration of the chiral center is (S). Double check with another ordered pair of substituents.

The sketches below, taken from the Grasping the Concepts of Stereochemistry, Nancy S. Barta and John R. Stille, *J. Chem. Educ.* 1994, 71(1), 20- 23, who invented this technique, illustrate that this method works no matter how awkwardly arranged the drawing.

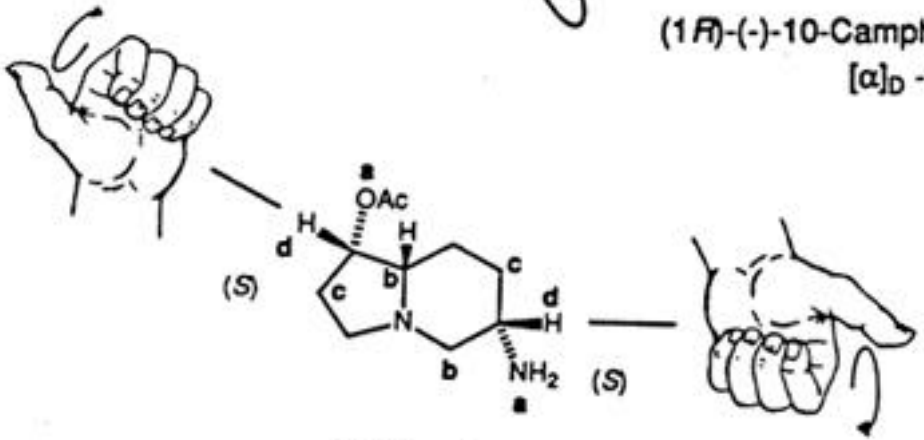




(*S*)-(+)-Lactic Acid
$[\alpha]_D$ +3.8°



(1*R*)-(-)-10-Camphorsulfonic Acid
$[\alpha]_D$ -21°



(-)-Slaframine
$[\alpha]_D$ -15.9°

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