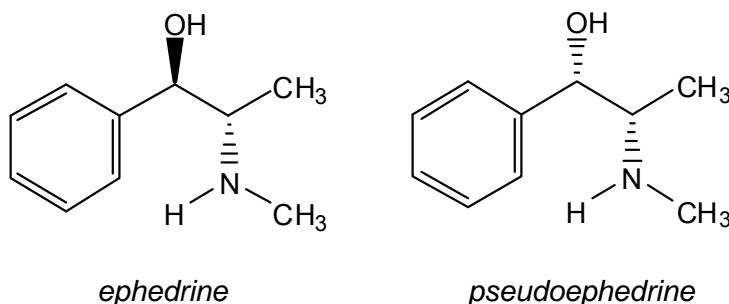


## Chemistry 2301

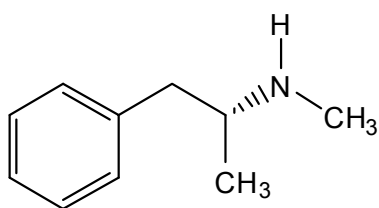
### Workshop 11 Enantiomers, Diastereomers, and Meth

Unlike most other over-the-counter pharmaceuticals, you have to show identification and sign a form to buy the antihistamines ephedrine and pseudoephedrine at the pharmacy. This is because of a law (the Combat Methamphetamine Epidemic Act of 2005) passed to prevent these pharmaceuticals from being converted to methamphetamine.



- a) Assign (*R*) or (*S*) stereochemistry to all chiral centers in the two molecules above. How would you describe the stereochemical relationship between ephedrine and pseudoephedrine? Are they stereoisomers? Enantiomers? Diastereomers? Are the molecules chiral? Are they *meso*?
- b) A meth lab cook would convert either of the molecules above to methamphetamine by chemically replacing the  $-OH$  group with an  $-H$ . Draw this change; draw methamphetamine, by replacing either of the  $-OH$  groups above with an  $-H$ .

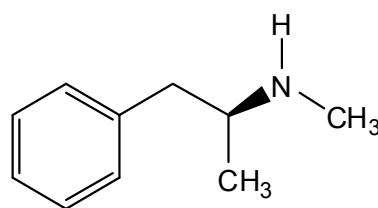
One of the molecules below is the meth lab cook's product, methamphetamine. The other is levomethamphetamine, an active ingredient in Vicks Inhaler products. Which is which? (Circle one answer for each.)



**methamphetamine**

*or*

**levomethamphetamine ?**



**methamphetamine**

*or*

**levomethamphetamine ?**

- c) What is the stereochemical relationship between these two molecules? Are they stereoisomers? Enantiomers? Diastereomers? Are the molecules chiral? Are they *meso*?