

Answers to Problem 72, Chemistry 301X - 2006

Now consider a more complex “AMX” system. How many lines for  $H_a$ ?

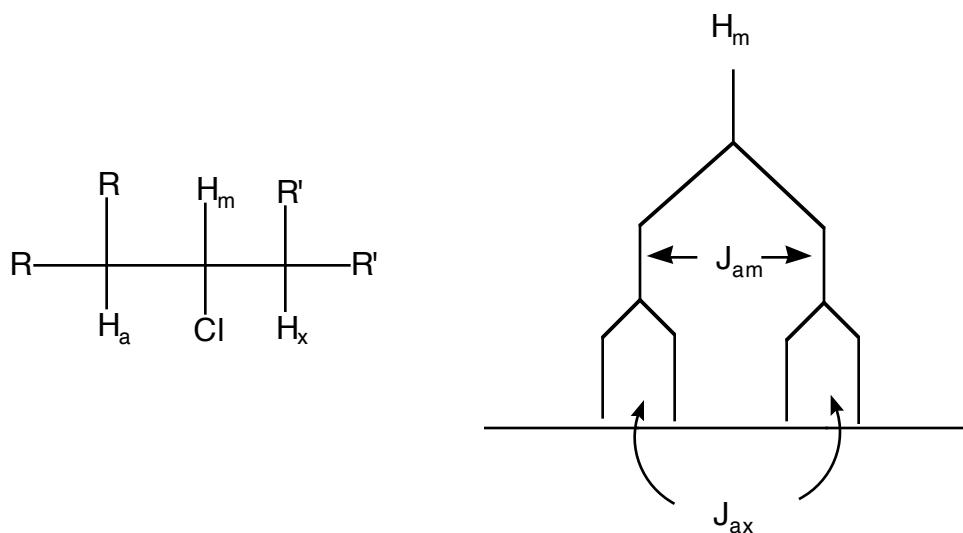
Two

How many lines for  $H_x$ ?

Two

OK that's easy. But how many lines for  $H_m$ ? That's not so easy.

$H_m$  will be a “doublet of doublets” - four lines:



Now use the supplied graph paper to see whether it makes a difference in which order you do the “tree” diagram.

Let  $J_{ma} = 2 \text{ Hz}$  and  $J_{mx} = 4 \text{ Hz}$ .

Does it make a difference? (it had better not!)

it doesn't.

What happens if  $J_{ma}$  and  $J_{mx}$  are very, very close?

overlap problems are likely.