

Organic Chemistry 1
CHEM 2323
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Bonus# 1

Road Map;

You are handed a vial with an unknown sample and your bonus problem is to determine the structure.

The first test you perform is a standard GC-MS(don't worry about this yet), the GC-MS tells you the sample is one compound with a molecular formula of $C_{13}H_{20}$.

You realize from the formula that there are a large number of isomeric structures possible for this formula.

You perform the following tests.....to slim down this number.

You add Br_2 and determine the unknown is a fully saturated alkane.

You heat the sample and it stays pure, which eliminates the possibility of a cyclobutane.

1 Which general structures can you have?

You take an aliquot of your unknown and run a series of NMR experiment to determine, the presence of;

- 1 quaternary carbon
- 4 tertiary carbons
- 2 secondary carbons
- 6 primary carbons

#2 How many isomeric structures can you draw at this point?

#3 Of those isomers, the target compound has a plane of symmetry and is C_2 -symmetric.

What is it?