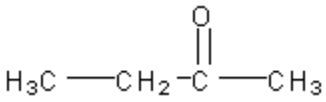
ROSEDALE
ACADEMY

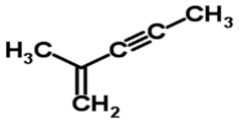
Name:

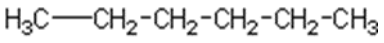
SCH4U Unit 2 - Practice Questions B [Answer Key]

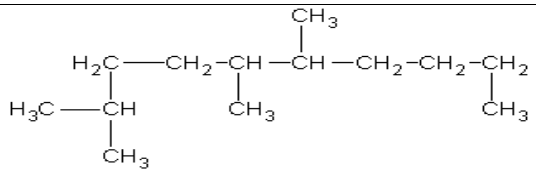
1. Match the organic compound class name to the structural formula below. *[A, 6: 0.5 each]*

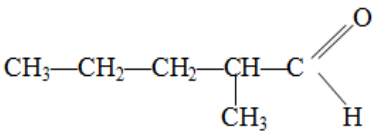
i  **K**

ii  **G**

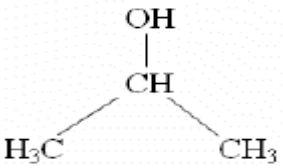
iii  **C**

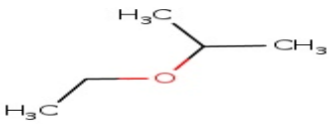
iv  **F**

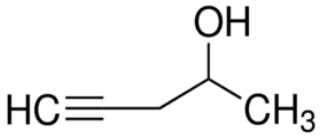
v  **E**

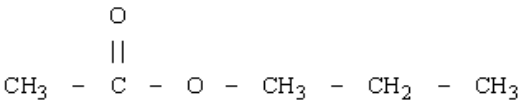
vi  **J**

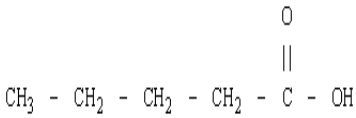
vii  **L**

viii  **D**

ix  **I**

x  A

xi  **B**

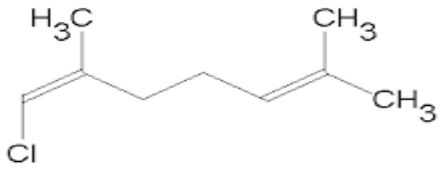
xii  **H**

A) 4-pentyn-2-ol
B) propyl ethanoate
C) 2-methyl-1-penten-3-yne
D) Propan-2-ol
E) 2, 5, 6-trimethyl decane
F) hexane
G) butanone
H) 1-pentanoic acid
I) ethoxy propane
J) 2-methylpentanal
K) 1,3-cyclopentadiene
L) dec-5-yne

Name:

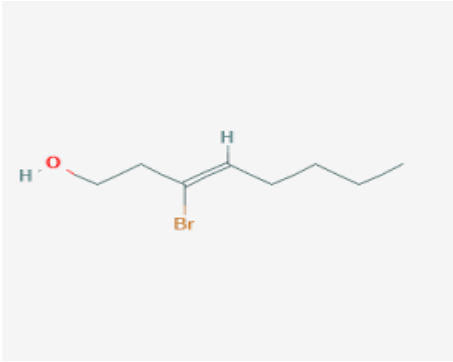
2. Name the following compounds. *[A, 8; 2 each]*

(a)



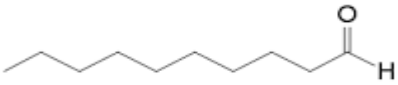
1-chloro-2,6-dimethyl-1,5-heptadiene

(b)



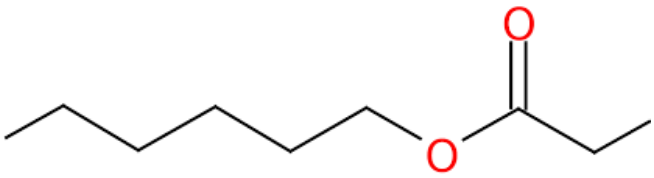
3-bromo-3-octene-1-ol

(c)



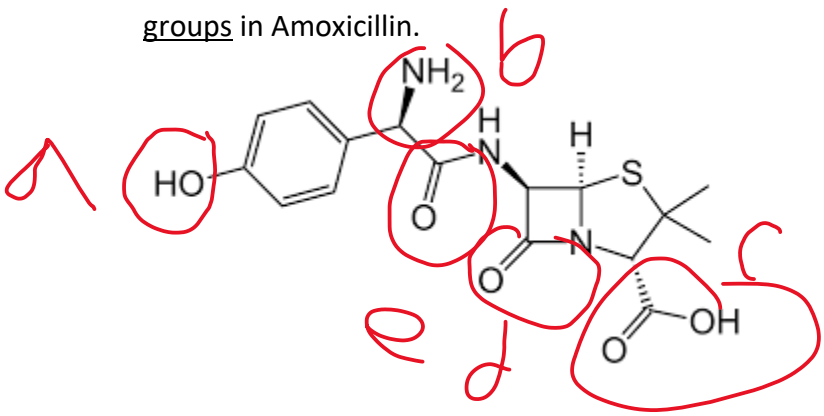
decanal

(d)



hexyl propanoate

3. The structure below is an antibiotic called Amoxicillin. **Circle and name** 2 <u>different functional groups</u> in Amoxicillin. *[A, 2; 1 each]*



a= hydroxyl, b=amino, c=carboxyl, d=ketone, e=ketone

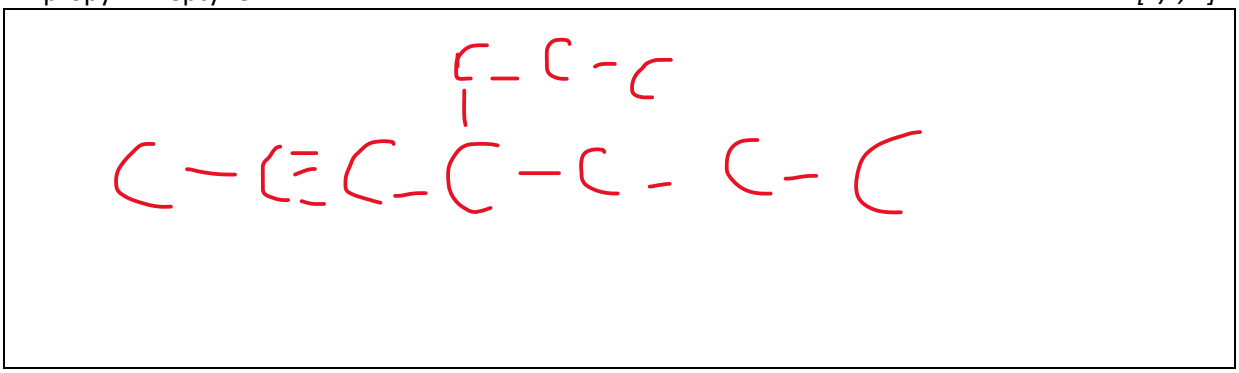
SECTION 2: Drawing

4. Complete the following table.
   a) Draw two alcohols with the molecular formula $C_5H_{12}O$. *[T/I, 4: 2 each]*
   b) State the name of the alcohol. *[A, 2: 1 each]*

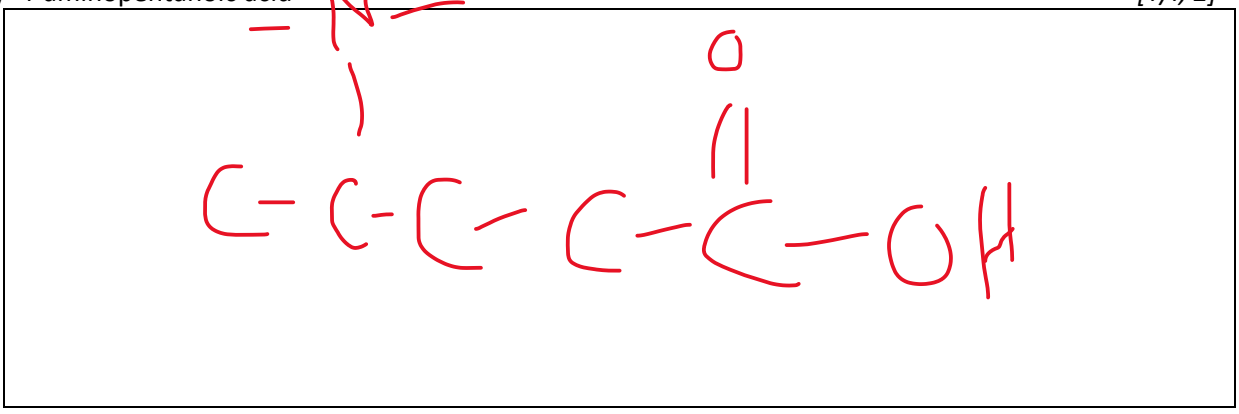
Name of Alcohol	**1-pentanol, 3-methyl-1-butanol**	**2-methyl-1-butanol, 2,2-dimethyl-1-propanol**
Structural Formula		

5. Draw the structural formula for the following organic compounds: *[T/I, 8: 2 each]*

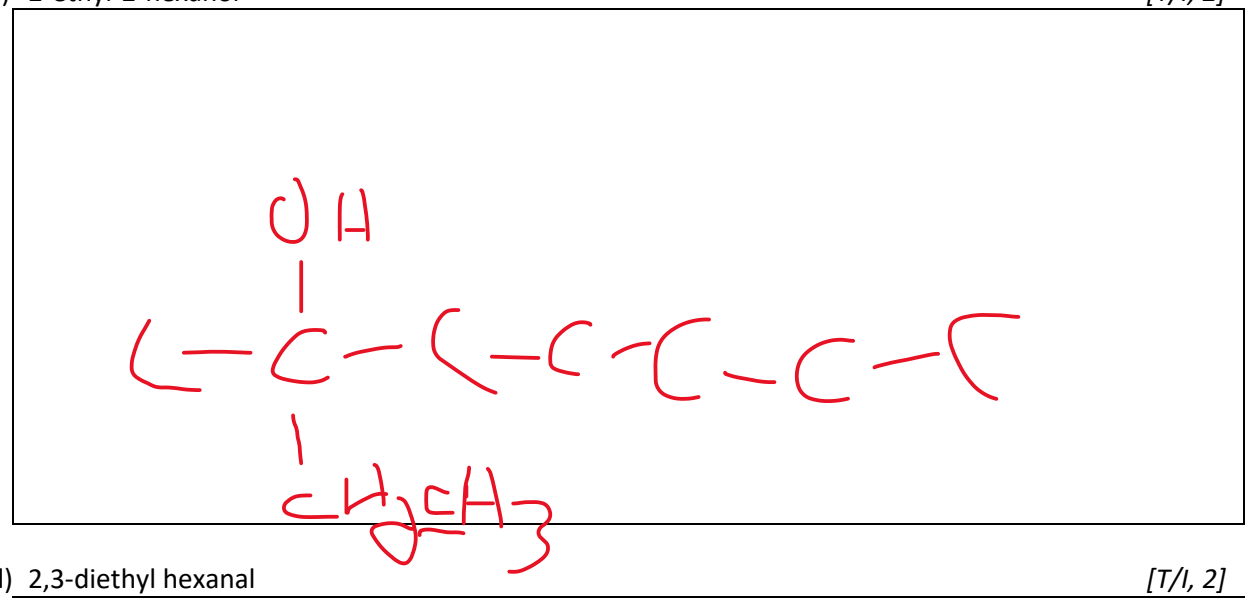
(a) 4-propyl-2-heptyne *[T/I, 2]*



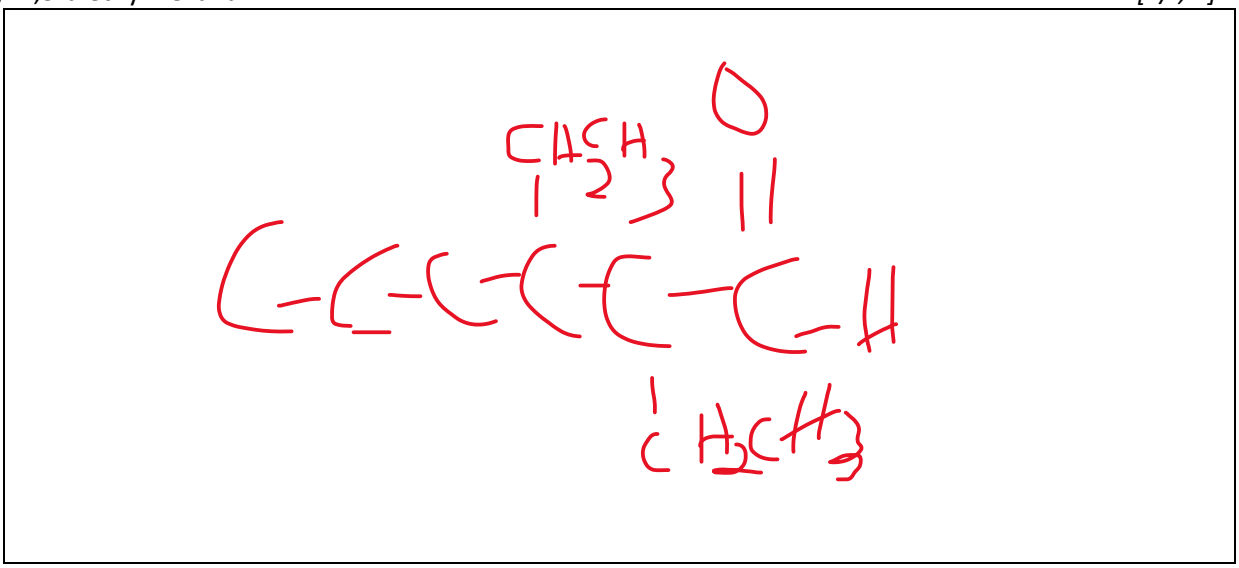
(b) 4-aminopentanoic acid *[T/I, 2]*



(c) 2-ethyl-2-hexanol *[T/I, 2]*



(d) 2,3-diethyl hexanal *[T/I, 2]*



SECTION 3: Communication – Long Answer (Questions 17 - 18)

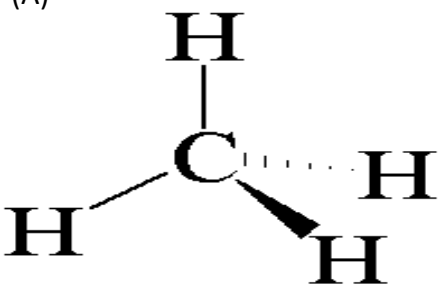
The following questions will be graded according to the following rubric:

Criteria	Level 4	Level 3	Level 2	Level 1
APPLICATION Making connections between science, technology, society, and environment	makes connections between science, technology, society, and the environment with a high degree of effectiveness **(3 marks)**	makes connections between science, technology, society, and the environment with considerable effectiveness **(2 marks)**	makes connections between science, technology, society, and the environment with some effectiveness **(1 mark)**	makes connections between science, technology, society, and the environment with limited effectiveness **(0 - 0.5 mark)**
COMMUNICATION Information and ideas are communicated with complete and correct answers	Information and ideas are communicated clearly and precisely **(2 mark)**	Information and ideas are communicated with considerable clarity and precision **(0.1 marks)**	Information and ideas are communicated with some clarity and precision **(0.5 marks)**	Information and ideas are communicated limited clarity and precision **(0 marks)**

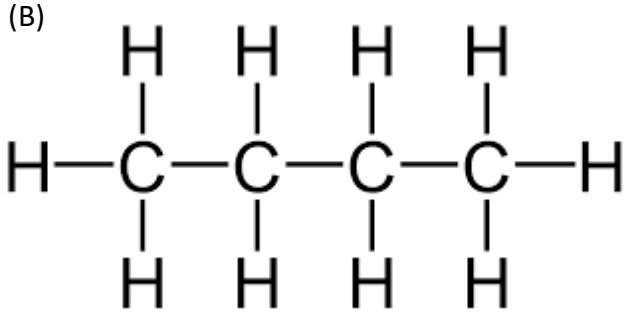
6. Butane is commonly found in lighters, while methane is a greenhouse gas that is locked in permafrost.

[A, 3; C, 2]

(A)



(B)



Identify which structural formula is methane and butane. How are they related structurally? Which one would you think is used in lighters? Which one do you think is a gas? Give reasons for your answer.

The first molecule is methane and the second one is butane. Butane would be used in lighters because it has a longer hydrocarbon chain which increases the number of London dispersion forces, enough so that the substance is a liquid. Methane would be a gas because there are not as many London dispersion forces attracting it to itself. Also, butane has more bonds to break when it is combusted so more energy will be released.

7. Explain which compound in each of the following pair will have the higher ***boiling point***.

[A, 3; C, 2]

pentane or heptanol.

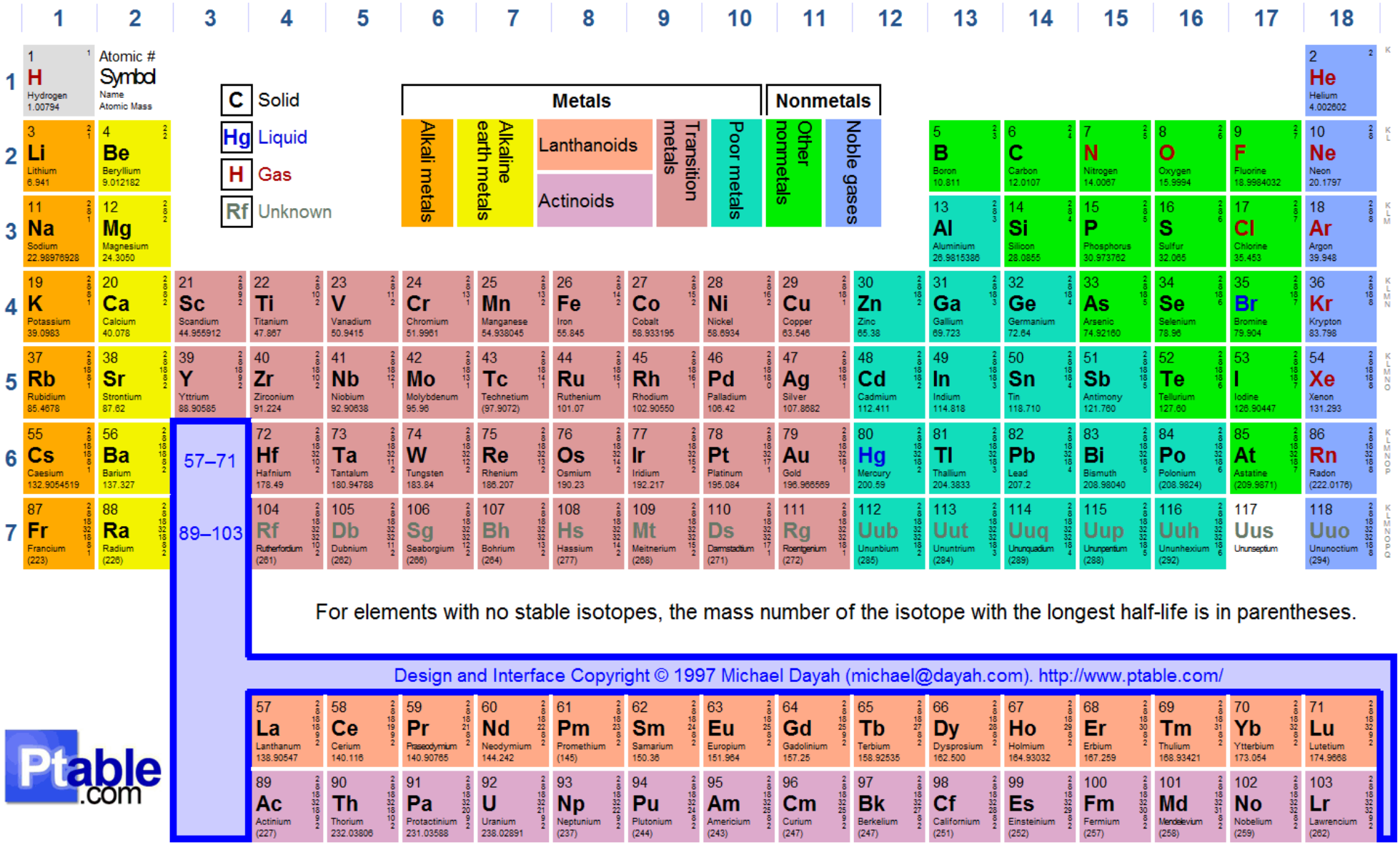
Heptanol will have the higher boiling point. When boiling, the intermolecular bonds between molecules are broken. The stronger the bonds, the higher the boiling point. Heptanol has a higher boiling point than pentane because:

a) It has a longer hydrocarbon chain so more London dispersion forces can exist between molecules
b) It has a hydroxyl group that allows it to hydrogen bond to itself. Hydrogen bonds are much stronger than LDF

REFERENCE RESOURCES:

Names of the first 10 alkanes

# of Carbon atoms	Name	Molecular Formula
1	methane	CH_4
2	ethane	C_2H_6
3	propane	C_3H_8
4	butane	C_4H_{10}
5	pentane	C_5H_{12}
6	hexane	C_6H_{14}
7	heptane	C_7H_{16}
8	octane	C_8H_{18}
9	nonane	C_9H_{20}
10	decane	$C_{10}H_{22}$



For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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