ABUBAKUEZE GOODNESS EBELE
19/MHS01/101

Steochumistry and Functional Groups

1 Name the functional groups present in each of the following molecules

1. $CH_2 = C(OH)HCHO$

- $-OH$ - Alkanols or alchols.
- $-CHO$ - Aldehydes or alkanals.

2. $C_6H_5CH(NH_2)COCH_3$

Ketones $(-COCH_3)$

Amine $(-NH_2)$

3. $CH_3 = CHCH(OH)CHO$

Hydroxyl $(-OH)$

Aldehyde $(-CHO)$

2. A 0.856g sample of pure (2R, 3R)-tartaric acid was dilut to $10cm^3$ with water and placed in a 1.0dm polarimeter tube th observed rotation at 20°c was +1.0°. Calculate the specific rotation of (2R, 3R)-tataric acid

Solution

$$[\alpha]_\lambda^T = \frac{\alpha}{cl}$$

where $[\alpha]$ = Specific optical rotation

α = observed rotation

c = concentration in g/mL

l = path length (in dm)

$\alpha = +1.0°$

$l = 1.0\ dm$

$C = ?$

The concantration is always measured in g/ml. In the qestion we were already given the mass in g so convert the volume of water ($10cm^3$) to ml

$1\ litre = 1000cm^3$

$1ml = 1\ cm^3$

$1cm^3 = 1ml$

$10cm^3 = \frac{10\cancel{cm^3} \times 1ml}{1\cancel{cm^3}} = 10ml$

$Concantration = \frac{g}{ml} = \frac{0.856}{10}$

$= 0.0856\ g/ml$

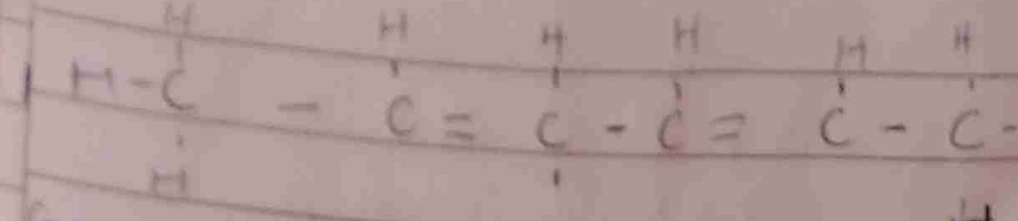
$[\alpha]_D^T = \frac{1.0}{0.0856 \times 1} = +11.68°$

3. Draw the possible geometric isomers (where possible) for each of the following compounds

i) Hexa-2,4-diene

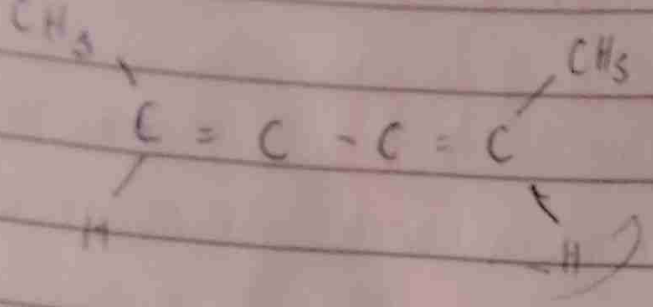
ii) 2,3-Dimethylbut-2-ene

Answers



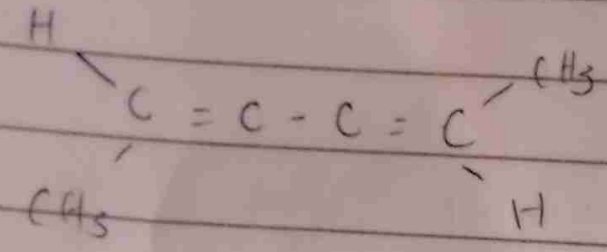
Hexa-2,4-diene

(a)

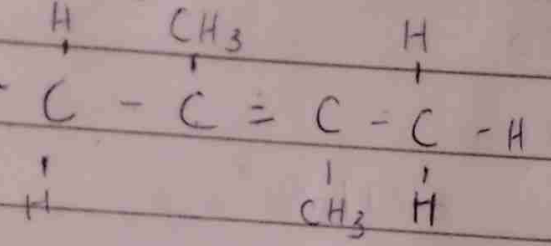


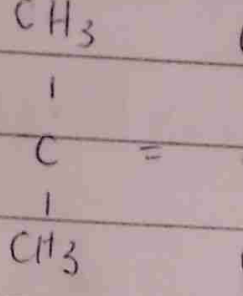
Cis-hexa-2,4-diene

(b)



ii 2,3-Dimethyl but-2-ene





~~CIS~~ - Geometric isomerism is not possible for ~~2,3 Dimethyl~~ 2,3 Dimethyl but-2-ene