
(4 scores)

(b) (i) By writing all possible isomers of T and IUPAC name, Identify the isomer to be used to produce compound X

(3 scores)

(ii) Identify the required hydrocarbon X and write all its possible isomers and respective IUPAC names

(2 scores)

(b) write the equations for the conversions of;
(i) isomer of T identified to X and suggest mechanism

(1 score)

(ii) 1,2-dichloro-2-methyl propane

(1 score)

(iii) 1-bromo-2-methyl propan-2-ol and state the importance of this reaction in organic chemistry

(2 scores)

Item 2

An aluminium smelting company in Namanve industrial park uses a substance called aluminium fluoride as a way to lower the melting point of cryolite during aluminium extraction. However, the production unit is facing high energy costs and the environmental team reports challenges in dissolving wastes of aluminium fluoride residues before disposal. The research chemist is tasked to analyze the thermochemical feasibility of both forming and dissolving aluminium fluoride using available thermodynamic data to determine whether these processes are spontaneous or energy intensive. Across a certain article the following data was discovered by the researcher

Type of enthalpy change	Magnitude(KJ/mol)
Standard enthalpy of formation	-1301
Enthalpy of atomization of aluminium	+314
Bond dissociation energy of fluorine	+158
First, second and third ionization energies of aluminium	+577,+1820,+2740 respectively
First electron affinity of fluorine	-348

