

INTER HALOGEN COMPOUNDS

Project work submitted to

Vikrama Simhapuri University, Nellore

In partial fulfillment for the award of the degree of

Bachelor of science in

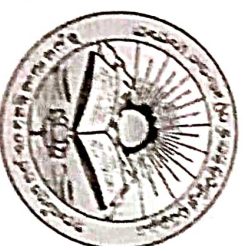
Chemistry

By,

E.Rajashekar

Research supervisor

Smt B Krupa Karuna Vani, Lecturer in Chemistry



DEPARTMENT OF CHEMISTRY

SKR GOVERNMENT DEGREE COLLEGE, GUDUR-524101,

TIRUPATI (Dist.), ANDHRA PRADESH, INDIA.

DECLARATION

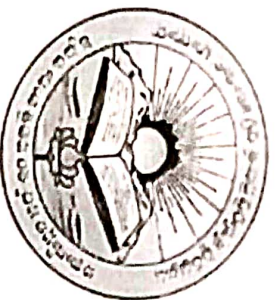
I, **E.Rajasekar, B.Sc.**, (first year),
Department of Chemistry SKR Government Degree College,
Gudur, A.P, do hereby declare that Project work entitled **INTER
HALOGEN COMPOUNDS** is carried by me under the guidance of
Smt B Krupa Karuna Vani, lecturer in Chemistry, SKR College,
Gudur, A.P. This work is original and has not been submitted for
any other degree or diploma.

Place: *Gudur*

E. Rajasekar

Date :

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Lecturer in Chemistry
SKR Government College
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CERTIFICATE

This is to certify that the project work entitled **INTER HALOGEN COMPOUNDS** submitted to **Vikrama Simphapuri university** is bonfire record of research work carried out by **E.RAJASEKHAR** for the award of **B.Sc., degree** in record of original research work done by him during the period of his study 2022-2023 under my supervision in the Department of Chemistry **SKR government degree college, Gudur** and has not been submitted in part or full for award of any degree/diploma /associate ship /fellowship /any other similar title.

BK K

Place : Gudur
Date :

{BKK Vani}
Research Supervisor

REFERENCES

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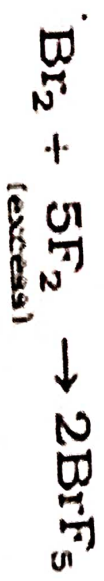
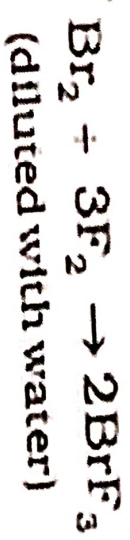
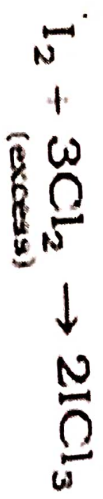
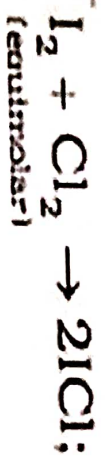
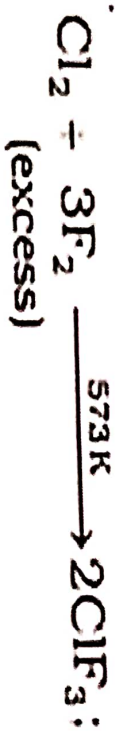
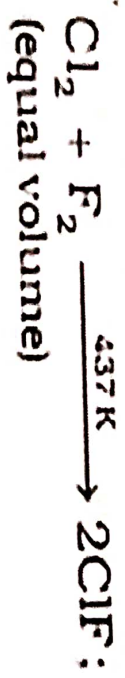
PREPARATION

We can manufacture these interhalogen compounds by **two main methods**.

One of them includes **the direct mixing of halogens** and the other includes **reaction of halogens with the lower Interhalogen compounds**.

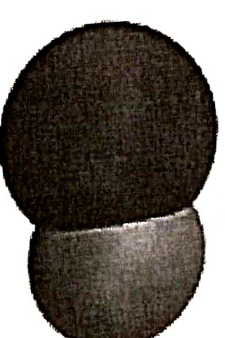
The halogen atoms react to form an interhalogen compound. One example includes the reaction when a volume of chlorine reacts with an equal volume of fluorine at 473K. The resultant product is chlorine monofluoride.

In other cases, a halogen atom acts with another lower interhalogen to form an interhalogen compound. For example, fluorine reacts with iodine pentafluoride at 543K. This gives rise to the compound of Iodine Heptafluoride.



Iodine mono chloride ICl

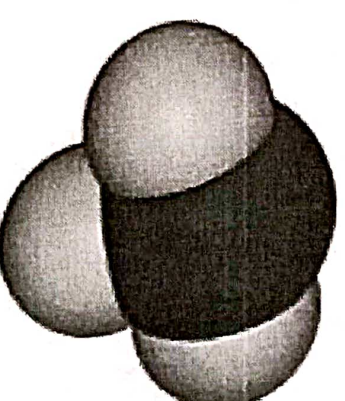
is formed by passing chlorine over solid iodine at temperature below 0 °C.



- It is a red-brown chemical compound
- Because of the difference in the electronegativity of iodine and chlorine, ICl is highly polar ; I^+Cl^-

Bromine trifluoride... BrF₃

- It is obtained by mixing bromine vapor and fluorine in a stream of nitrogen at 20°C.



It is a straw-colored liquid with a pungent odor.

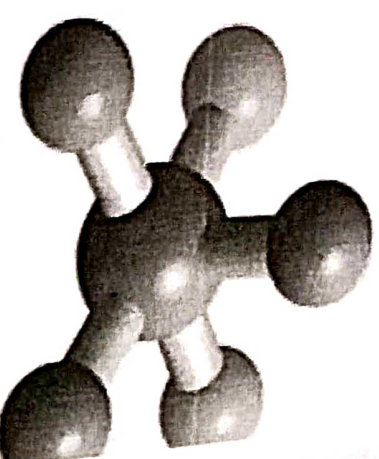
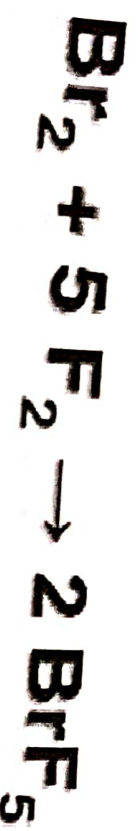
It is a powerful fluorinating agent

It is used to produce uranium hexafluoride (UF₆) in the processing and reprocessing of nuclear fuel.

Bromo pentafluoride ... BrF₅

It is pale yellow liquid

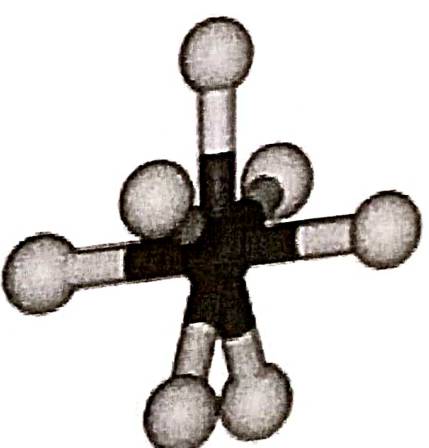
By the direct reaction of bromine with excess fluorine at temp. over 150°C



It is an extremely effective fluorinating agent, converting most uranium compounds to the hexafluoride at room temperature like BrF₃.

Iodine heptafluoride.... IF_7

- It is a colorless gas
- It is prepared by passing a mixture of iodine pentafluoride vapors and fluorine through a platinum tube at 300°C .



- It is a strong oxidizing agent
- Used to prepare periodic acid.

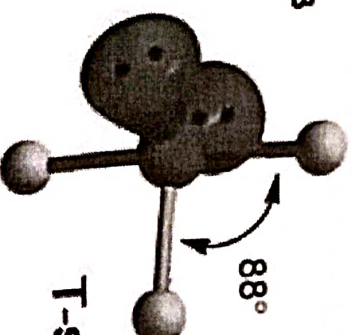
Shapes of interhalogens

ClF



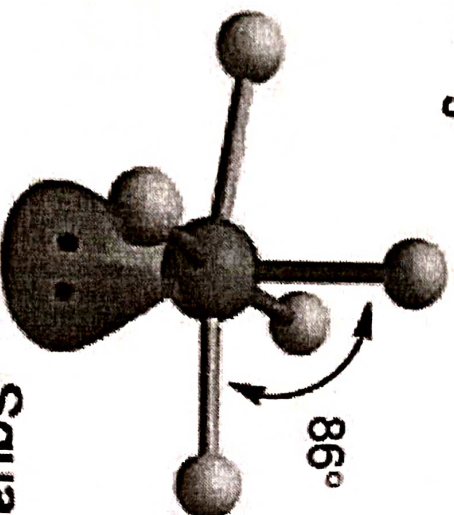
linear, XY

ClF_3



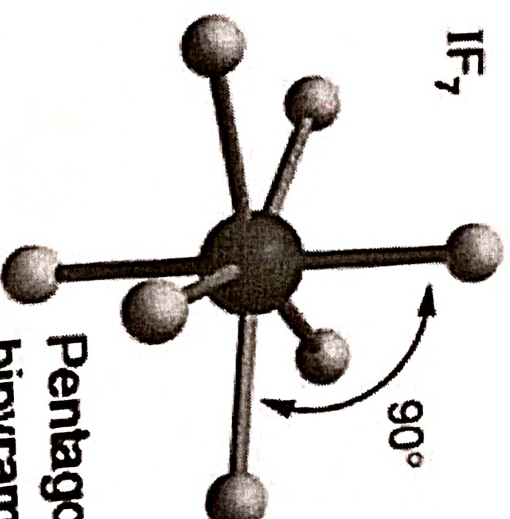
T-shaped, XY_3

BrF_5



Square
pyramidal, XY_5

IF_7



Pentagonal
bipyramidal, XY_7

Uses of Interhalogen Compounds

- We use interhalogen compounds as non-aqueous solvents.
- Also, we use these compounds as a catalyst in a number of reactions.

• We use UF_6 in the enrichment of ^{235}U . We can produce this by using ClF_3 and BrF_3 .



• We use these compounds as fluorinating compounds.