

Practical work N°:04

STUDY OF THE HALOGEN FAMILY

Introduction :

The halogens, a group of chemical elements found in the 17th column (or VIIA) of the periodic table. The halogens include fluorine (F, Z=9), chlorine (Cl, Z=17), bromine (Br, Z=35), iodine (I, Z=53), and astatine (At, Z=85), listed in order of increasing atomic mass. Halogens share similar chemical properties, largely due to their electron configuration and high electronegativity. Electronegativity measures an atom's attraction for electrons in a chemical bond, and fluorine is indeed the most electronegative element in the entire periodic table. In their elemental state, halogens exist as diatomic molecules, meaning they combine as pairs of atoms to form molecules. Due to their strong reactivity and their ability to gain an electron to achieve a stable electron configuration, halogens react vigorously with other elements. They readily form compounds with nearly all other elements, and these compounds have significant applications in various fields of chemistry and industry.

Aim of Practical Work:

Check that the elements in the same column of the periodic table have common chemical properties. To do this, we will choose two or three elements from the same column and we will make them react on the same reagent.

Materials and reagents:

Test tubes, graduated pipette, sodium chloride solution, sodium fluoride solution, potassium iodide solution, silver nitrate solution, lead acetate solution.

Operating mode (Reactivity of halide ions):

a-with silver ions Ag⁺ : Prepare 3 Test Tubes and Pour into

-the first: 3ml of sodium chloride solution.

-the second: 3ml of sodium fluoride solution.

-the third: 3ml of potassium iodide solution.

Add 1ml of a silver nitrate solution to each of the 3 tubes.

b-with lead ions Pb²⁺: Repeat steps "A" replacing the silver nitrate with lead acetate.