3. REVIEW OF LITERATURE

The first intrinsic conducting polymer was reported by Shirakawa et. al (1973) Polyacetylene, a conjugated organic polymer, could attain high levels of electronic conductivity when oxidized by suitable reagents initiated a significant research. The concept of conductivity and electroactivity was quickly broadened from polyacetylene to polypyrrole; an aromatic heterocyclic polymer by Diaz et. al (1979) Polypyrrole due to its stability in air was one of the compounds having highest potential for commercial applications. Angelopoulos et. al (2001) have found NMP (N-methyl-2-pyrrolidinimone) as a good solvent, for emeraldine base, many researchers make an effort to verify the intrinsic property of conducting polymers in processing. For instance, polyaniline film, elastomer and blend were produced from the NMP solution, and the crystallinity, orientation of polymer chain, morphology, and conduction characteristics of these materials were investigated. Prakash T. et. al (2002), have observed thermal sensor properties of polyaniline doped with camphor sulfonic acid (CSA) thin films, developed using solution casting method on glass substrate.

Pharhad A.M et. al (2003) prepared Chloride doped polyaniline films directly from an electrolyte containing HCl and aniline monomer at different concentration ratios. The polymer films have been studied by cyclic voltammetry. FTIR spectra have been recorded for confirmation of Cl- ion doping of the polymer films. Electrical conductivity has been measured by LCR Mitester Hioki model 3532-50. The FTIR spectra of the polyaniline samples have been taken by using Nicolet Impact 410 FTIR spectrophotometer. The results shows that at low monomer concentration (= 0.1M), and low rate of polymerization, The poly-aniline films obtained were with smooth surface, better adhesion, less porosity and with uniform distribution, but at higher concentration (0.15M) of aniline, the rate of polymerization is high, but the film surface was rough non uniform, flaky and show poor adhesion to the electrode. It was also concluded that higher acid concentration does not lead to increase in the rate of polymerization beyond a certain limit.

Sutar D.S. et. al (2008) prepared the highly crystalline PANI films grown by surface graft polymerization at the substrate polymer interface were investigated using C-AFM. The PANI films grown on amino-silane modified degenerated Si formed an ideal MIS structure. The single crystallites scattered all over the surface of the film act
as conductive pads on the insulating alkyl SAM. Polyaniline thin films prepared by employing RF plasma polymerization are irradiated successfully with swift heavy silicon ions at different fluencies. FTIR spectral results are compared with the standard data and based on the FTIR analysis the structure for the pristine polyaniline and the irradiated polyaniline are proposed. The changes in optical band gap for irradiated samples are evaluated and it is found that the optical band gap reduces with increase of fluence. From the absorbance studies, the numbers of clusters for pristine and irradiated polyaniline is calculated (29).

**Stakhiora P. et.al (2010)** show that the technique of ionic sputtering of polyaniline in permanent crossed electrical and magnetic fields within the argon discharge make it possible to create thin films of a polyaniline emeraldine form. These films are amorphous and isotropic which is confirmed by the results of an X-ray analysis and by ellipsometry.

**Abalyaeva V.V. et.al (2015)** discusses the features of electrochemical synthesis and behavior of polyaniline and polyaniline based composites doped by electro active anions. It has been found that in some cases electro active anion forms complex with the aniline molecule in electrolyte, which performs as initiator of polymerization. This provides acceleration of the initial stage of aniline electro polymerization. As a result, it becomes possible to prepare high-quality corrosion resistant polyaniline coatings on non-noble metal electrodes. The composites based on polyaniline and nanocarbon materials (carbon nanotubes, graphene oxide) have been prepared, which are promising for use in supercapacitors.

**Nicolas R.Tanguy et.al (2017)** recently, there is an increasing interest in ammonia sensing and detection for a wide range of applications, including food, automotive, chemical, environmental, and medical sectors. A major challenge is to obtain selective, sensitive and environmentally stable sensing polymer/chemical materials that can meet the stringent performance requirements of these application areas.