This thesis entitled Electrical Conduction and Dielectric Behaviour of Thin Films of Vacuum Evaporated Amorphous Silicon Hydrogenated Amorphous Silicon and Chemically Deposited Cadmium Sulphide. In this thesis preparation of a—Si:H thin films by vacuum evaporation using tungsten baskets is presented and their electrical and dielectric properties are reported. The thesis is divided into seven chapters. These includes the introduction to the subject, the general methods of thin film preparation along with the merits and demerits, a detailed investigation on the d.c. and a.c. electrical properties of a-Si and a-Si:H, details of dielectric property of a-Si:H films, and preparation and characterization of another semiconductor--cadmium sulphide. The investigations presented in this thesis are mainly centred around the electrical properties of amorphous silicon and cadmium sulphide thin films. In the detailed analysis of the results of the investigations on d.c. and a.c. electrical conduction on a-Si and a-Si:H, it has been proved that a-Si:H films prepared by the present method are very similar to the glow discharge produced films as far as the electrical properties are concerned. The investigations on the adsorbate induced d.c. conductivity changes in the a-Si and a-Si:H thin films have established the effect of donor type and acceptor type gases. The investigations have shown that by simply exposing a silicon film to hydrogen does not change its conductivity much. A careful examination of the various reviews on the properties of a-Si:H would reveal that it exhibits a variety of electrical properties making it one of the most important materials for device applications.