Of the nonferrous metals, the unique importance of aluminium is due to its important properties like high strength, high corrosion resistance, high thermal conductivity, high electrical conductivity, high reflectivity, low density, nonmagnetic properties, ease of machining and fabrication and extremely attractive brightness and finish.

The remarkable corrosion resistance of aluminium is due to the formation of transparent oxide film on the surface. However, in circumstances which induce a deterioration of this protective film, aluminium is corroded.

The fabrication of aluminium articles commenced in India in 1912, but extraction of the metal began only in 1943. India possesses abundant deposits of high quality bauxite which are estimated at 250 million tons. The progress of aluminium industries in India is linked with the development of hydroelectric power.

The importance of utilization of aluminium in India is enhanced by the fact that the resources of other nonferrous metals are inadequate. We are highly deficient in copper, zinc and lead. Nickel, tin, molybdenum and tungsten either do not exist or exist in uneconomic pockets. Aluminium being the only abundant nonferrous metal, its utilization in
all the possible ways is important and essential. Efforts are made in this direction and the consumption of aluminium in India has multiplied six times over the past two years. The demand for aluminium has tripled in five years (50,000 tons in 1961, 150,000 tons in 1966). Further development of aluminium industries is being planned to meet with the demands.

Due to the unique position of aluminium in nonferrous metal industry in India, the study of its corrosion and retardation is very important. It was, therefore, planned to investigate the corrosion of aluminium in hydrochloric acid and its inhibition. The substances investigated by us have been reported in literature as corrosion inhibitors for other metals, but it is well known that the results obtained with an inhibitor for one metal cannot be readily applied for another metal. The results obtained are presented in this thesis.

I express my deep gratitude to my guide, Dr. M.N. Desai, not only for his guidance and encouragement but also for his sympathetic and kind help.

I am grateful to Dr. A.M. Trivedi, Professor of Chemistry, and to Dr. B.K. Vaidya former Professor of Chemistry for providing working facilities.

My sincere thanks are due to Dr. Miss. M.H. Gandhi for her interest in my work. I thank Mr. B.M. Desai, Mr. Y.C. Shah,
Dr. S.S. Rana, Mr. C.B. Shah, Mrs. S.M. Desai, Mr. V.K. Shah, Mr. G.H. Thanki, Mr. B.K. Panjani and other friends for their cooperation during the tenure of my work.

I am grateful to the Ministry of Education, Government of India for the award of a Research Scholarship since November 1966.

Y.B. DESAI
