

Review of Atmospheric Corrosion Studies in Kenya: Past, Present and Future.

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ABSTRACT

Atmospheric corrosion of metallic materials is of particular concern because it accounts for more failures in terms of tonnage and cost than any other type of environmental corrosion. The exposure of a metal to natural ambient atmosphere would cause corrosion of the metal. Huge amounts of materials in industries, automobiles, bridges and buildings are exposed to the atmosphere and are therefore attacked by various environmental pollutants in the atmosphere. Atmosphere varies considerably in terms of moisture content, temperature, and the amount of pollutants. Kenya being within the tropics and having an ocean along the coastal region, is expected to show an atmospheric variation. It is therefore important to understand the factors driving atmospheric corrosion in Kenya. These factors include temperature, Time-of-Wetness, the presence of pollutants and salt aerosols at the coast and the interaction between these factors. There are no past studies on atmospheric corrosion in Kenya that have addressed these issues. Hence the need to initiate such studies. Currently the Department of Chemistry, University of Nairobi is collaborating with the Mabati Rolling Mills on a corrosion project whose aim is to investigate atmospheric corrosion of metallic coated and pre-painted steel roofing products in selected sites in Kenya. A series of ISO standards to define environmental factors for four major metals – aluminium, copper, steel and zinc are now available and this will be useful in this study. The current study focuses on coated steels which form the back-bone of metal based building materials. The availability of climatic data for Kenya is important in conducting accelerated tests on the materials and in planning exposure programmes that will provide more detailed Zn coated and Zn-Al coated performance data. In addition to accelerated tests, exposure tests on racks are planned. The atmospheric corrosion studies are intended to improve the quality of the roofing materials from the Mabati Rolling Mills. For future work, a corrosion map for Kenya is to be produced and further we envision establishing a center of excellence on corrosion studies at the department of chemistry, University of Nairobi. This will help in combating atmospheric corrosion and to liaise with industries on matters of corrosion.

Key words: Atmospheric corrosion, environmental pollutants, ISO standards, centre of excellence