UNIVERSITI TEKNOLOGI MARA

A LITERATURE REVIEW ON LOCAL PATENT APPLICATIONS FOR CORROSION INHIBITORS DEVELOPMENT USED IN THE PROTECTION OF FERROUS AND NON-FERROUS TYPES OF SURFACES

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ABSTRACT

The phenomenon of corrosion appears in various industrial applications and responsible for numerous losses in industries around the world. Corrosion affects the durability of the infrastructure assets and industrial equipments. Thus, this phenomenon remains as a major concern in industries around the world. Corrosion inhibitor is known as the best methods to prevent degradation of metal surface as it can prevent or control corrosion process by selection of highly corrosion resistant materials where it must be suitable to the operating conditions. Corrosion inhibitors are used in a wide range of industrial applications such as oil and gas industries, cooling water system, reinforced concrete, paints, lubricants and more. Corrosion inhibitor particularly extends the life of the infrastructure and industrial equipments therefore saving large expenses in materials equipment and structures. This review is an analysis of the number of local patents applications for corrosion inhibitor development used in the protection of ferrous and non-ferrous types of surface.

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CHAPTER ONE
INTRODUCTION

1.1 RESEARCH BACKGROUND

Corrosion is a process of destruction or degradation of the metal surface by chemical or electrochemical reaction with their environment where it resulting in the lowering of mechanical strength [15]. This phenomenon considered as a major concern to industries around the world regarding to the numerous losses in industries. Prevention is the best way to prevent this problem.

Corrosion can be controlled by modifying the aqueous environment and by neutralizing or removing corrosive agents [32]. Corrosion inhibitor is one of the best and most useful known method to prevent the deterioration of the metal surface in the industries due to excellent anti-corrosive properties, low cost and easy practice method [16][28].

Inhibitors are substances or mixtures that in low concentration and in aggressive environment inhibit, prevent or minimize the corrosion [16]. A corrosion inhibitor is a chemical substance which, when added in a small concentration to an environment reduces the corrosion rate of a metal exposed to that environment [15].

Corrosion inhibitors decrease the rate of corrosion when added in relatively small quantities to the system under corrosion [32]. Proper material selection is essential to find corrosion resistant materials that are suitable to the operating conditions and at the same time, economic and adequate control methods should be employed to extend the useful life of aluminum, copper, steel and magnesium alloys [32]. Corrosion inhibitors are used in a wide range of industrial and commercial applications such as oil and gas fields, cooling water system, reinforced concrete, paints pigments, water treatment, metallurgy, semi-conductors and electronics industries.

This study is an analysis of the number of local patents applications for corrosion inhibitor development that are used in the protection of ferrous and non-ferrous types of surface in Malaysia in 10 years starting from 2006. The analysis conducted will be on the number of patents, type of corrosion inhibitors, and