

Study the Feasibility of Using Eppawala Apatite for Corrosion Protection Coating for Metals

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Abstract

The process of atmospheric corrosion is a natural action of a material, even though it is a natural process; the corrosion is seriously affects on safe reliable operation of equipments or structures made by metals. In the case of metals there are many ways of controlling corrosion. Application of corrosion protection coating on metals is one of most popular and economical methods. It isolates the metallic surface from the aggressive media.

Here in this research mainly focused to study the feasibility of using powdered apatite with Polypropylene as a corrosion protection coating for metals. Powdered apatite was used as pigment for this coating because some properties observed in apatite is comparable with the properties of pigments used for powder coatings. Those properties of apatite are low chemical reactivity and low solubility in water and they improve some properties of the coating such as durability, corrosion resistance, and acid and alkali resistance. As well as apatite is non toxic mineral that does not bring any harmful effect to the human.

For all test specimens steel nails were used. Polypropylene resin and powdered apatite was used to prepare coating mixture. Powdered apatite and thermoplastic resin was mixed and kept in the oven at the melting temperature of the resin. Pre heated steel nails were dipped in to melted mixture in order to coat nail. Another set of nails were coated with melted resin only to use as reference samples. Coated samples were evaluated with respect to reference sample in different testing mediums. Performance of the coating was evaluated using weight loss measurements, corrosion rates and visual observations.

It was found that apatite-resin mixture showed much higher corrosion protection under all testing conditions than resin coat. Best performance of apatite resin coating was observed in water. Therefore there may be a possibility of using Eppawala apatite for corrosion protection coating for metal.