

塗布型クロメート皮膜の状態と物性に及ぼす 乾燥温度の影響

Influences of Drying Temperature on States and Physical Properties of Dry-in-place Type Chromate Coating Film.

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抄 録

Cr (III), Cr (VI) と、リン酸からなる塗布型クロメートについて、乾燥温度の影響を想定した熱分析を行い、その熱的な状態と耐食性と物性との関係さらに組成変化を検討した。

示差熱分析では無機物質特有の広い温度範囲にわたる反応が認められ、85℃から200℃の間に吸熱反応、200℃から300℃の間に発熱反応が認められた。この熱挙動から、クロメートを3つの状態に分類し、クロメート処理鋼板での耐食性を外観的あるいは電気化学的評価により比較したところ、吸熱反応を終了した乾燥温度が最も良いことが判った。またクロム固定率の測定結果によっても本組成の塗布型クロメートは熱的にいくつかの状態を持ち、その状態で密着性などの物性が異なることが明らかになった。

Abstract

Influence of drying temperature on states and physical properties of a dry-in-place type chromate coating which contains Cr(III), Cr(VI), and PO_4^{3-} were investigated by thermal analysis method. And also the relationship between thermal states and corrosion resistance was studied.

The result of differential thermal analysis method with the chromate coating at wide range of temperature shows characteristics reactions of inorganic materials.

Endothermic reaction at a range from 85°C till 200°C and exothermic reaction from 200°C till 300°C were found. The chromate coating can be divided into three states from the result of this thermal behavior.

The result of corrosion test of this chromate coated galvanized steel between visual and electrochemical method exhibits the best performance with drying at the end temperature of the endothermic reaction.

It was also proved by values of chromium fixed ratio in coating that chromate coating had several thermal states and exhibited different physical properties as adhesion strength etc..

Key words: dry-in-place type chromate coating; thermal analysis; chromium fixed ratio; corrosion resistance; solubility; physical property; drying temperature.