

## CS4

### Performance of Potassium Ferrate as Corrosion Inhibitor for Aluminum Alloys

포타슘 페레이트의 알루미늄합금의 부식 방지  
첨가제로서의 성능고찰

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Potassium ferrate( $K_2FeO_4$ ) has been manufactured by chemical synthesis in a reactor capable of producing 50Kg per batch with over 94% purity.

The purity analyses were made by a wet chemical analysis (chromite analysis method), UV/VIS spectroscopy, IR spectroscopy and XRD. Ferrate anion exhibits a characteristic of forming a protective film on metal surface, and hence has a potential for use as a corrosion inhibitor. For the inhibitor application, tests were made with ferrate and chromate for carbon steel and aluminum alloys (1000, 5000, and 6000 series), at room temperature and ambient atmospheric pressure. Results indicate that for carbon steel, ferrate's performance was not as good as that of chromate, showing a passivation current almost a decade higher than that for chromate. The passivation potential range, however, was comparable to that for chromate. For the aluminum alloys, ferrate exhibits an excellent inhibition capability, surpassing that of chromate ion. The typical serration (current fluctuation) observed with chromate disappears when ferrate is used. Ferrate's performance on aluminum alloys surpassed that of chromate in terms of both the passivation current stability and the passivation potential range.