

# Effects of Colloidal Silica Addition on the Self-Healing Function of Chromate Coatings

*Arata SUDA*\*<sup>(1)</sup>

*Tadashi SHINOHARA*\*<sup>(2)</sup>

## Abstract

The corrosion prevention mechanism of the chromated metal materials is considered to be attributable to the self-healing function of the chromate coatings. In this study, the corrosion behaviors of dry-in-place type chromate coated galvanized steel specimens have been studied using a scanning vibrating electrode technique. By this method, the effects of colloidal silica addition in the chromate coating on the self-healing function have been examined. The results confirmed that the chromate coatings prevent the corrosion of metal under coating or at coating defects by their self-healing function. The self-healing function of the chromate coatings is due largely to the formation of a Cr compound layer from the dissolved Cr(VI) ions in the electrolyte. The addition of colloidal silica greatly enhances the self-healing function and corrosion protection of the dry-in-place type chromate coating.