黃銅의 脫亞鉛現象에 미치는 添加元素의 影響

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Effect of Additive Alloying Element on the Dezincification of Brass

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Abstract

Dezincification phenomenon of 70% Cu-30% Zn brass containing small amounts of Sn (<1.7%) has been studied in 0.5M acidic chloride solutions. All the specimens used were prepared originally from electrolytic copper and zinc and chemical grade tin. Recording of potentiodynamic polarization curves and examination of the microstructure for the specimens in various conditions were main expeimetal techniques. Poteniodynamic polarization curves thus obtained revealed that 7/3 brass could initilly be dezincified either by selective dissolution of zinc or by copper redeposition mechanism depending on the electrode potential. Experimental results showed that addition of small amount of tin (from 0.74% up to 1.76%) to 7/3 brass could inhibit dezincification in case the copper redeposition mechanism holds. This was found to be possible through that the added tin promotes hydrogen evolution reaction on the brass and this h. e. r. competes with copper redeposition retarding the latter. In other words. dezincification in 7/3 brass is replaced to general corrosion by the eddition of small amounts of tin.

Microscopic examinations for the specimens which had been subjected to potentiostatic polarization at given potentials showed that the well-defined dezincfied layer could only be developed at elevated temperature (90°C), and in case the dezincified copper layer had already formed on the electrode surface.

It was found through the microscopic examination of the dezincified dezincified specimen that the dezincification front occured in 7/3 brass was protruding along the grainboundaries in the brass matrix, indicating the latter was serving a a diffusion channel for the outgoing zinc aton to the electrode/solution interface.