

CS03

A comparison of corrosion properties between leaded brasses and unleaded brasses containing Bi in potable water system.

수도물에서의 Pb-황동과 Bi-황동의 부식 특성 비교

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Brass alloys are widely used of fittings and valves for transporting supply water. Since conventional brass alloys had poor machinability, small amounts of lead are added to brasses to improve machinability. However, the serious medical problems can occur due to the leaching of Pb. Recent research has shown the leaching of lead from brass fittings. The new unleaded brasses containing bismuth have been developed. These new alloys have been evaluated in terms of machinability, tensile strength, and ductility. Thus, It is believed that aqueous corrosion characterization is essential to the continued development of unleaded brasses. The objective of the present work is to evaluate the new unleaded brass alloys in terms of their resistance to aqueous corrosion in potable water system. The corrosion rates of brasses in synthetic tap water have been determined using potentiodynamic polarization. Potentiostatic studies show that the leaded brass is more effective preventing dealloying of α - β brasses. In addition, the electrochemical behavior of brass alloys was investigated in synthetic tap water under open-circuit and potentiostatic conditions using electrochemical impedance spectroscopy (EIS). Cross-sections of the specimens after potentiostatic tests were investigated by scanning electron microscopy (SEM) and electron probe microanalysis (EPMA). The leaded brass had only a slight tendency to dezincification, whereas the Bi-containing brasses were more susceptible.