CORROSIVE EFFECTS OF *BACILLUS THURINGIENSI S* ON COPPER IN SALTY NUTRIENT BROTH MEDIUM

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Microbiologically influenced corrosion (MIC), has increased importance in metals and alloys of corrosion in recent twenty years [1]. MIC has been reported in oil and gas industries, in water containers, in bridges, in structure like gangplanks and in modern industry of various sectors. The bacteria on the metal surface occurs biofilm layers [2]. The biofilms cause increasing or decreasing of corrosion rates. *Bacillus thuringiensis* (Bt) is a gram positive bacterium and commonly used as a control agent for pests [3]. Bt strains produce crystal proteins, called δ-endotoxins, which have insecticidal action. These pesticides are regarded as environmentally friendly, with little or no effect on humans, wildlife, pollinators, and most other beneficial insects. In this study, *Bacillus thuringiensis* serotype *aizawai* was investigated for corrosive effects on copper. The corrosive behaviour of copper electrode has been determined by using electrochemical impedance spectroscopy (EIS) and linear polarization techniques (LPR). The electrodes were immersed into sterilized beakers control medium and medium with microorganisms for 30 days. Electrochemical measurements were carried out at certain time intervals (1<sup>st</sup>, 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup> and 30<sup>th</sup> days). The amount of microorganisms was also determined spectrophotometrically. Electrochemical impedance diagrams of copper immersed for different times in the medium with and without bacteria were presented as Figure 1.

![Figure 1. Bode modulus diagrams of copper immersed for different times in the medium with and without microorganism (□: without microorganism ■: with microorganism, (a) 1, (b) 14, (c) 21 and (d) 30 days)](image)

Amount of microorganisms were increased periodically. Resistance values were a bit higher in medium with bacterium than the control medium.

References

