



“Gheorghe Asachi” Technical University of Iasi, Romania



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## THE BEHAVIOR OF MILD STEEL IN WATER CHARACTERIZED BY VOLTAMMETRY

Alexandra Ciomaga<sup>1\*</sup>, Gheorghe Nemțoi<sup>2</sup>

<sup>1</sup>Al. I. Cuza“ University from Iași, Faculty of Geography and Geology, Carol I Boulevard 20 A, Iași 700505, Romania

<sup>2</sup>Al. I. Cuza“ University from Iași, Faculty of Chemistry, Carol I Boulevard 11, Iași 700506, Romania

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### Abstract

This paper displays the kinetics of the corrosion process for short-term immersion of seven mild steel samples of similar compositions. A comparison between the data obtained for corrosion process in three types of water: bidistilled water (BW), drinking water (DW) (tap water) and river water (RW) (from Bahlui River, Iasi, Romania) has been done. Electrochemical techniques such as the cyclic voltammetry (CV), the linear voltammetry (LV) and the rotating disk electrode technique (RDE) have been used for the characterization of both the steel samples and the aqueous environments with which they came in contact. The allure of the cyclic voltammograms indicates the appearance of localized corrosion. The data analysis of the potentiodynamic polarization curves allowed the determination of the polarization resistance ( $R_p$ ), the corrosion potential ( $E_{corr}$ ), the corrosion current density ( $j_{corr}$ ), the Tafel slopes ( $b_a$  and  $b_c$ ) and the corrosion rate ( $v_{corr}$  in mm/year). The rotating disk electrode technique was used for the quantitative determination of iron ions before and after different immersion periods in the studied media. It was found that in the RW, unlike in the case of BW and DW, the concentration of  $Fe^{2+}$  decreases in time.

**Keywords:** corrosion, cyclic voltammetry, mild steel, rotating disk electrode technique

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\* Author to whom all correspondence should be addressed: e-mail: [ciomaga.alexandra@yahoo.com](mailto:ciomaga.alexandra@yahoo.com); Phone: +40 747 432 190