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# A new methodology in scanning electrochemical microscopy: cross section analysis in the investigation of corrosive processes of steels with metallic coating

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Resumo:

Among the electrochemical tests under development, scanning electrochemical microscopy (SECM) stands out for allowing the investigation of corrosive processes in situ, since it is capable of providing information with high spatial resolution on a small scale, in addition to allowing the direct identification of electrochemical species involved in the ongoing corrosive processes. In the study of automotive steel sheets coated with metallic alloys, a crucial region under the action of corrosive agents is the cross-sectional area. In this work, a new methodology for measures in spatial resolution at the SECM is presented. The applicability of this technique was demonstrated considering the corrosion behavior of a steel sheet coated with zinc, aluminum and magnesium alloy. Samples of this material were prepared according to this new methodology. Maps of pH variation, hydrogen evolution and oxygen distribution were obtained in the cross section area, in different electrolytes. With the acquisition of these results, it was possible to certify the applicability of this method in the study of coated metallic materials, as well as its potential to generate valuable contributions regarding the influence of the coating / substrate ratio on the electrochemical response of these materials.