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Comparative kinetic studies on the corrosion process using two methods based on the β -rays retention and atomic absorption spectroscopy

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The paper deals with the corrosion kinetics of some steels using two different methods of investigation. The first one is a radiochemical method based on the retention of β -rays emitted by a ^{204}Tl source, by the iron ions transferred into the solution by anodic dissolution of metal samples. The second one is based on the atomic absorption spectroscopy, follows the increase in time of the concentration of the same iron ions in the given aggressive medium. Nitric acid of different concentrations was used as corrosive medium. The obtained experimental data result in two different rate constants that can quantitatively characterize the corrosion process for each given reactant system by the proposed methods. The values obtained by these two methods of investigation are generally in keeping, however more precise will be those obtained through atomic absorption spectroscopy due to its higher precision in the determination of the concentration of the iron ions transferred into the corrosive solutions. However, the proposed radiochemical method seems easier and faster.

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