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Preliminary results on corrosion of Zr-1%Nb alloy in aqueous environment

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Resumo:

Zr alloys are used in nuclear reactors due to their neutronic transparency, good mechanical properties and corrosion resistance. This work intends to study the effect of surface preparation on the corrosion resistance of a Zr-1%Nb alloy through potentiodynamic polarization. Two tube samples of a Zr-1%Nb tube were submitted to a potentiodynamic polarization in a drop cell with a solution of 3.5% of NaCl. The first sample was only degreased using acetone and isopropyl alcohol and the second sample was ground only with 600 mesh sandpaper. The only degreased sample presented the breaking of the passive behaviour at about 1V, while the ground sample presented the breaking of the passive behaviour at about 0.22V. The difference between the results points to the protective character of the naturally grown Zr oxide but also points out that exposure to the non-oxidized metal can lead to a fast corrosion process.