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Question N. 1a) The short answer is no.
Taking the data from ANL-EBS-MD-000003 REV 00,
the corrosion rate appears to be negligible,
and there is no tendency to localized attack.

A possible concern is connected to radiation damage. What is the influence of defects or impurities on the passivity of alloy 22? An example in the literature

G. Blondeau, M. Froelicher, M. Froment, A. Hugot-Le Goff, C. Vignaud
Disappearance of Ni passivity through the introduction of foreign elements in the oxide crystallographic lattice. Passivity of Metals, R. P. Frankenthal, J. Kruger, eds. p.844. The Electrochemical Society (1978)

Question N. 2.a) The short answer is no,
based on the data in the above mentioned publication.

Again, a possible concern is the effect of radiolysis on the surrounding environment. Would radiolysis products, over a long time, modify the composition of the electrolyte in contact with the waste package, so as to cause localized corrosion?



in general, in order to make predictions with greater confidence on the long term behavior of the waste package, it would be useful to know something about the mechanism of the reactions occurring in the passive layer.

Examples of desirable studies

- A. Impedance
- B. Noise
- C. Kinetics of redox reactions on the passive layer
- D. Transport processes in the passive layer
- E. Composition and structure of the passive layer
- F. There are specimens (used to determine weight loss), which have been exposed to a simulated environment for months, perhaps years. Electrochemical measurements on these specimens could be compared with the results on fresh samples.



An example in the literature

A. Michaelis, S. Kudelka, J. W. Schultze. *Electrochim. Acta*, **43**, 119 (1998)

Effect of γ -radiation on the passive layers of Ti and Ti.2Pd container-materials for high level waste disposal

In conclusion, without information leading to the formulation of a model for the passive behavior of alloy 22, it is difficult to give more elaborate answers to the questions posed.

