

**Countermeasure against Localized Corrosion of
Stainless Steel 843K in Molten Lithium-Sodium
Carbonate.**

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The effect of temperature and gas composition on corrosion behavior of type 316L in a molten $\text{Li}_2\text{CO}_3\text{-Na}_2\text{CO}_3$ eutectic has been investigated. When the CO_2 pressure was higher than 0.02 atm and the temperature was lower than 843K, severe localized corrosion occurred. This localized corrosion seems to be caused by the instability of the iron rich outer scale under the CO_2 containing atmosphere. The countermeasure to prevent this local corrosion was also investigated. Once the sample had been kept for some periods in the melt under N_2 (or $\text{N}_2+5\%\text{H}_2\text{O}$), no severe corrosion occurred, even though the atmosphere shifted to the localized corrosion condition subsequently. From this result, it was cleared that localized corrosion was suppressed by forming LiFeO_2 layer on the metal surface in advance. The addition of H_2O into the atmosphere accelerated the formation of LiFeO_2 on the surface. Therefore, the addition of H_2O into the atmosphere could become effective method to prevent localized corrosion.

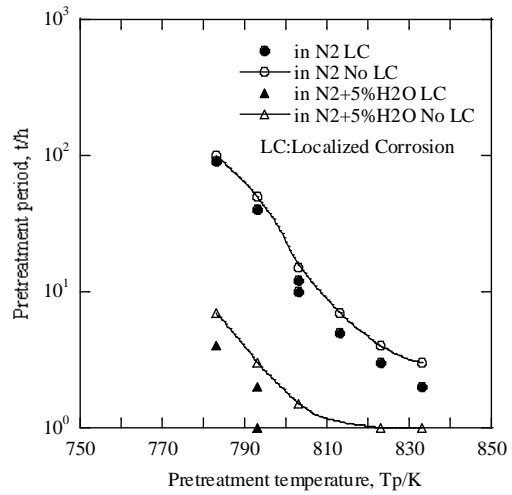


Fig.1 Effect of pretreatment of 316L in melt under N_2 or $\text{N}_2+5\%\text{H}_2\text{O}$ atmosphere on corrosion morphology after immersion test at -0.1V for 24h under $\text{N}_2+30\%\text{CO}_2$ atmosphere at same temperature as pretreatment. Open symbols denote general corrosion and solid symbol denote pitting corrosion.