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Effects of Cr, Mo and Cu on the Atmospheric Corrosion Resistance of Ferritic Stainless Steels in a Coastal Environment

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Synopsis :
Effect of alloying elements on the resistance of ferritic stainless steels to atmospheric corrosion in coastal environment was evaluated by atmospheric exposure tests and laboratory corrosion tests. Atmospheric exposure tests showed that pitting corrosion resulted in rusting and that atmospheric corrosion resistance of the steels increased with an increase in Cr content and with addition of Mo and/or Cu. Ferritic stainless steels with higher Cr and Mo contents, such as 30Cr-2Mo steel, were also shown to have excellent resistance to atmospheric corrosion in coastal environment. Laboratory corrosion tests showed that Cr and Cu were effective in preventing the generation and growth of pits respectively, while Mo played a significant role in both processes. From the results of both atmospheric exposure and laboratory corrosion tests, it was concluded that steels with pitting potentials higher than the critical values, which depended on the aggressiveness of environments, exhibited no rusting. These critical values can be used as one of the criteria for selecting exterior materials of buildings in various areas.

The body can be viewed from the next page.

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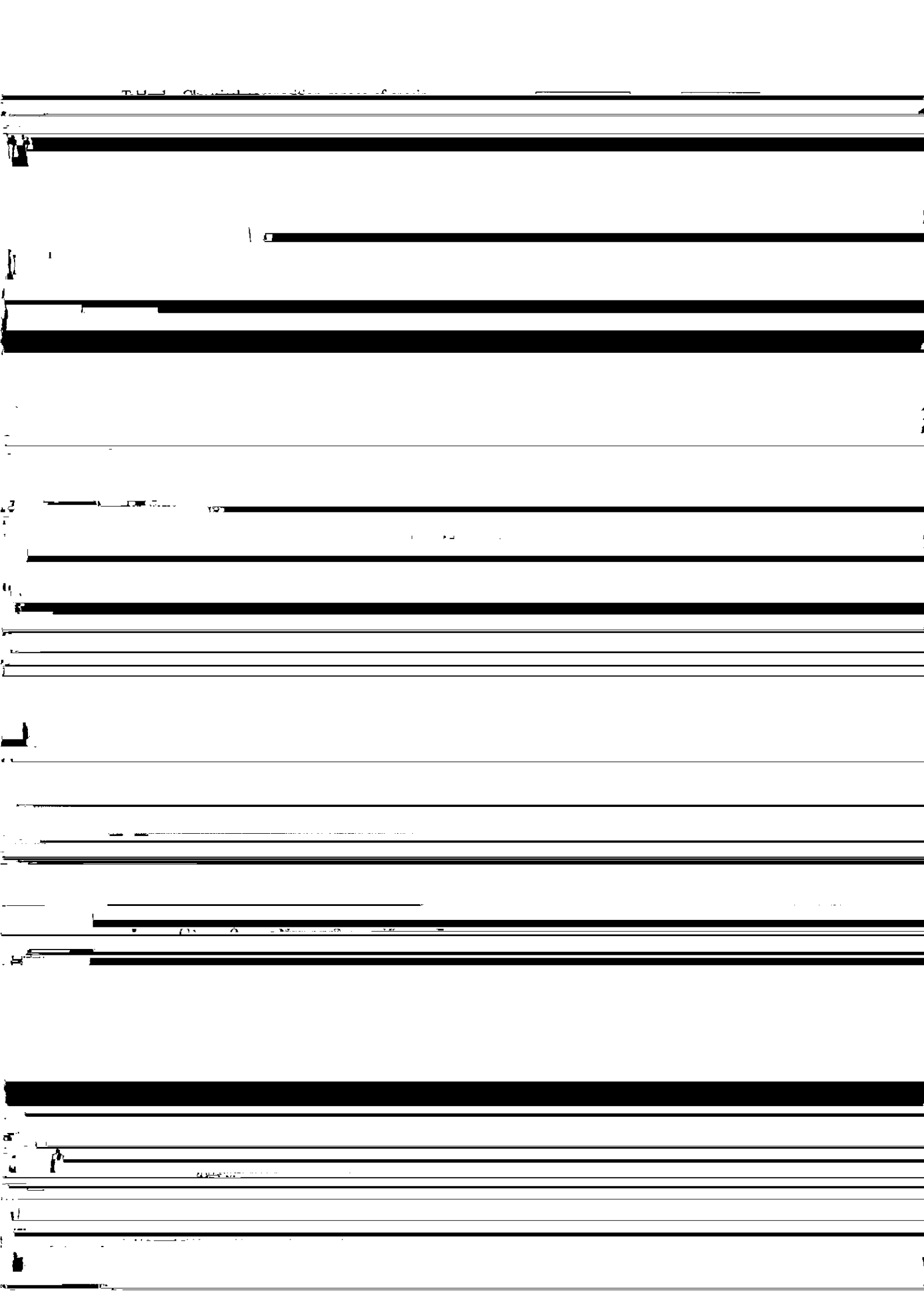
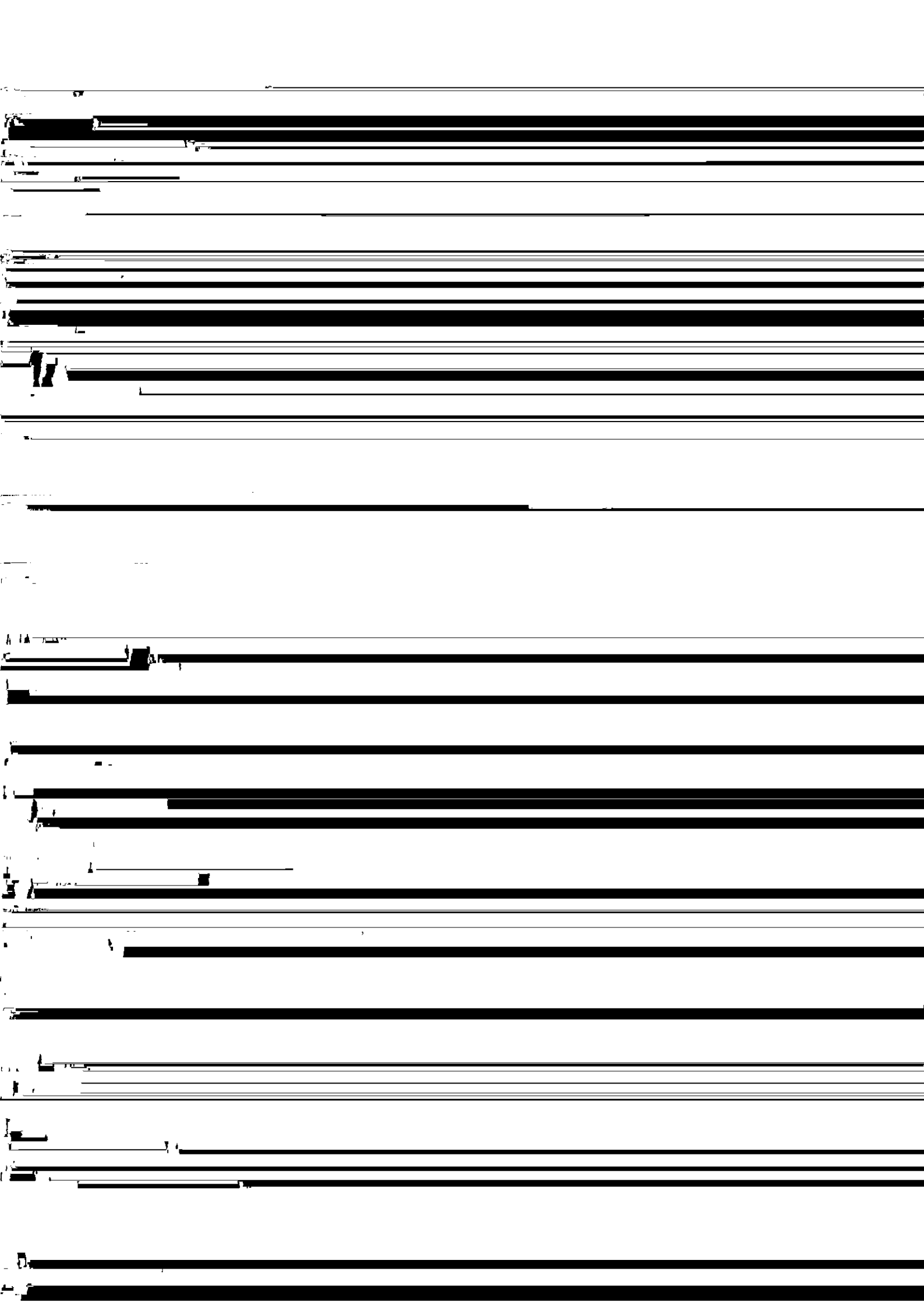
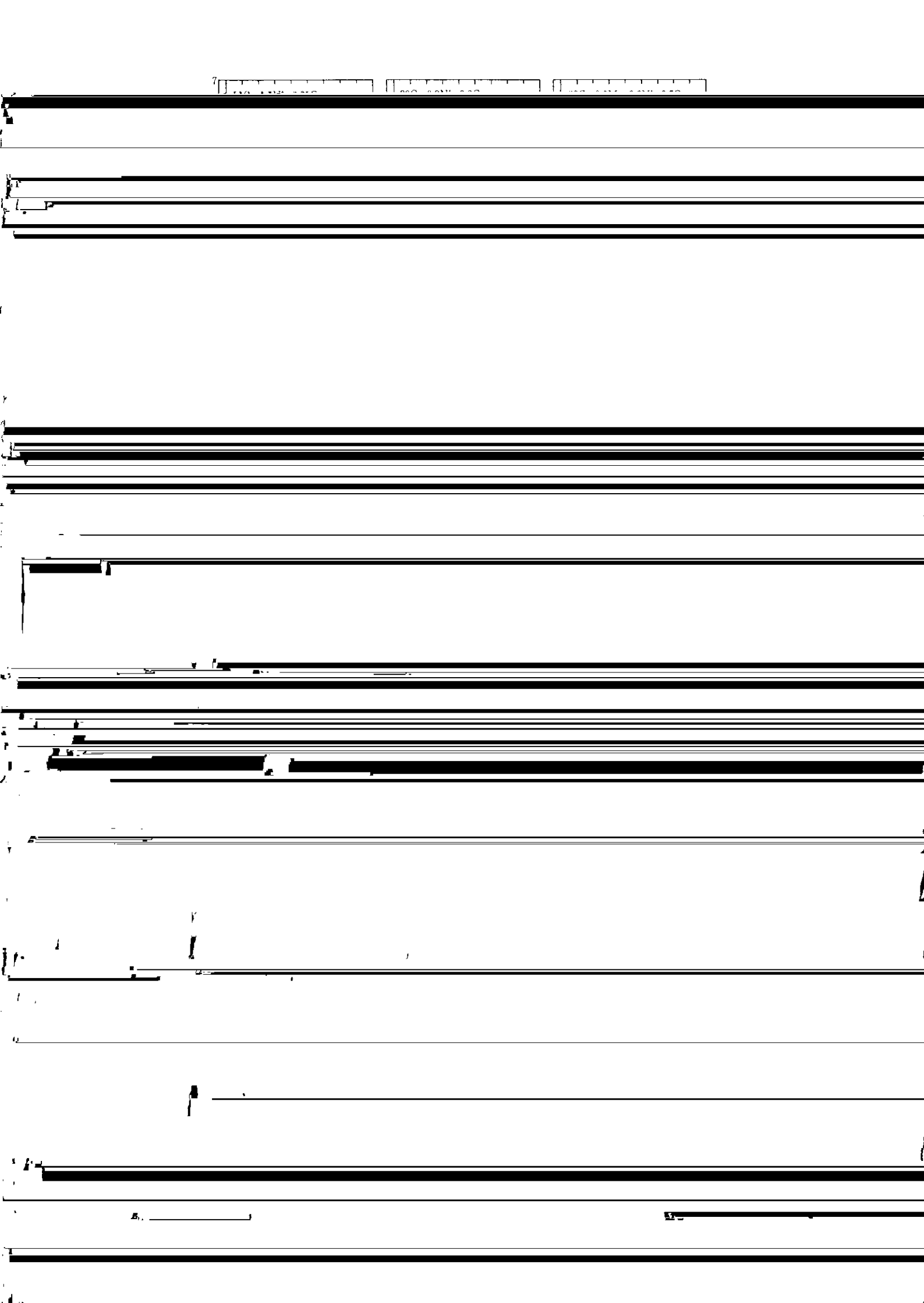
Resistance of Ferritic Stainless Steels in a Coastal Environment*

Synopsis:



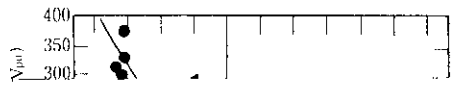




described earlier. Mo increased V'_{10} and, at the same

$Fe^{2+} + MoO_4^{2-} \longrightarrow FeMoO_4 \downarrow$ (slightly

soluble compound) (2)


400
350
300


90
80
70
Red rust

each exposure test period and test location, and then

5 Conclusions

product of the number of generated pits and the growth rate of the pits, and is proportional to $(V_{crit} - V'_{c10}) \times i_{crit}$.

the atmospheric corrosion resistance of ferritic stainless

area, it is necessary to use Mo-bearing high-Cr fer-