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MmeCo-007 - Structural Characterization and Corrosion Resistance of Fe–Ni–Cr–B Ribbons with Partial Amorphous Structure

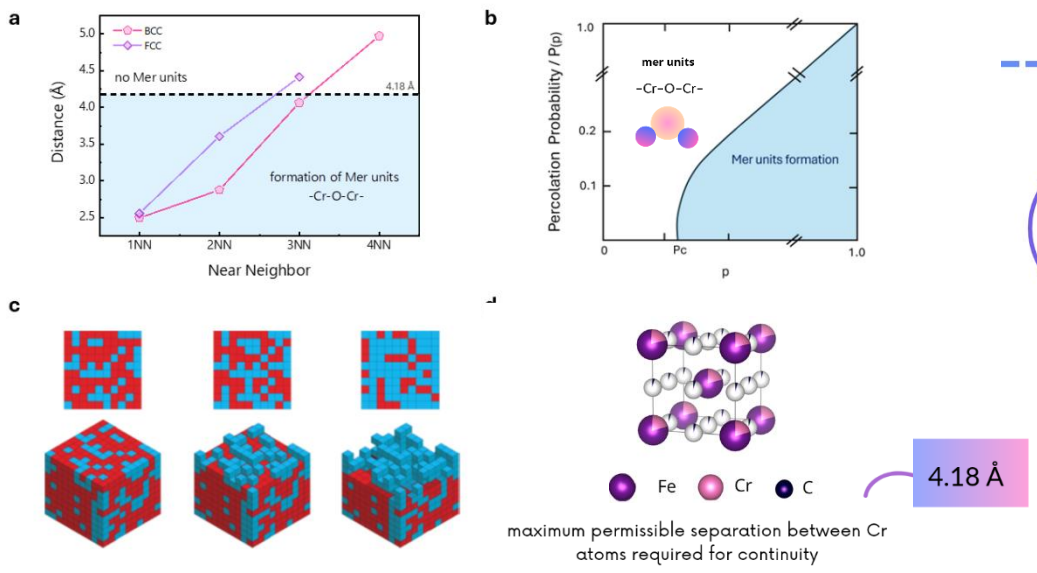
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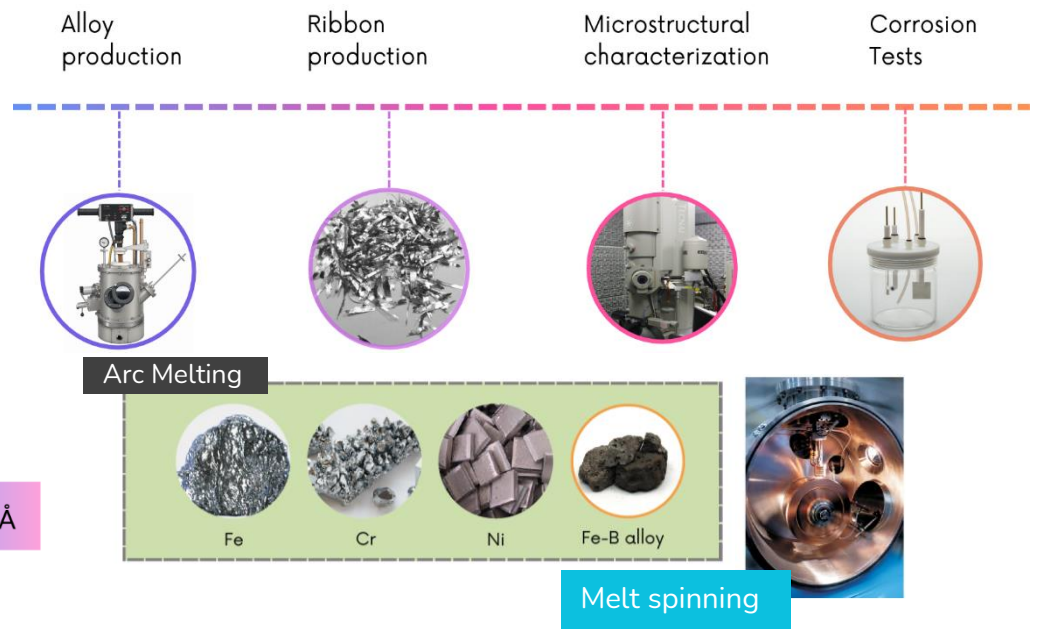
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Introdução / Introduction



Metodologia / Metodology



Resultados/ Results

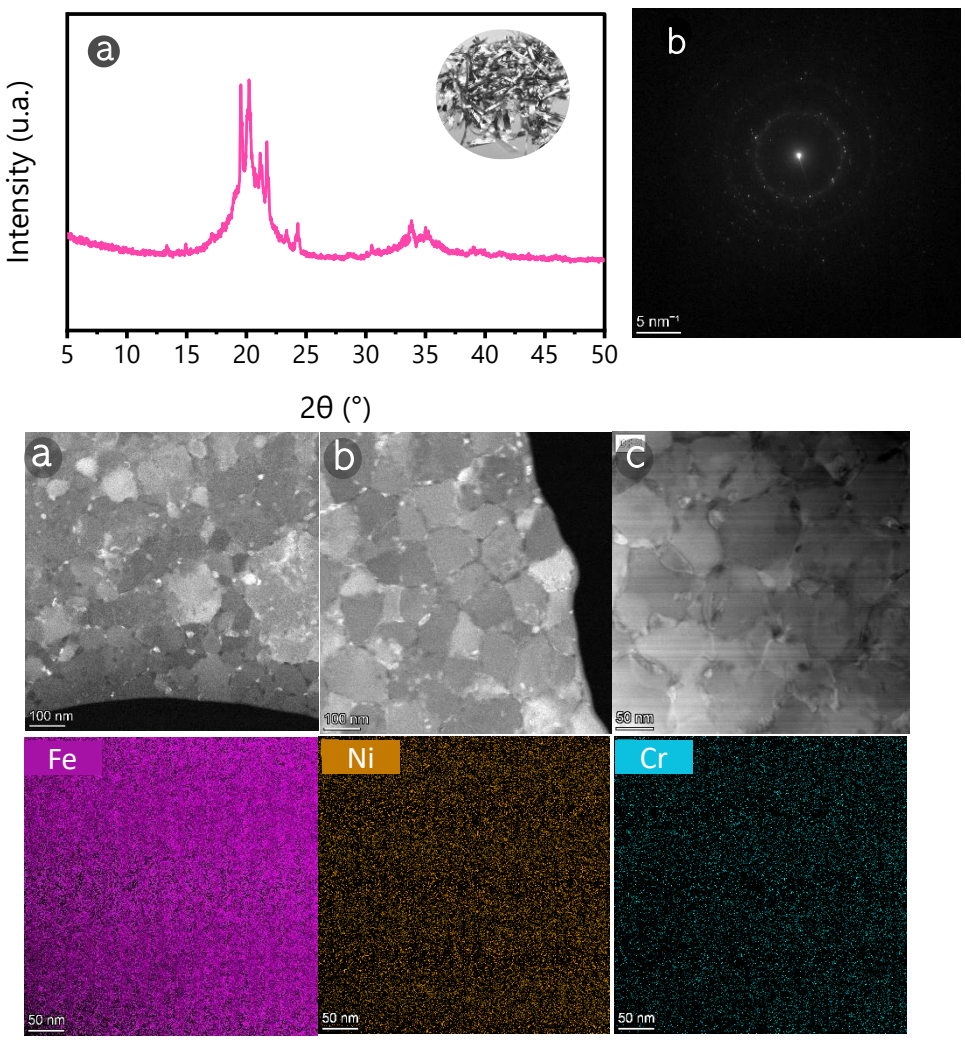


Figure 2. (a–c) Dark-field TEM images of different regions of the 3 wt% Cr ribbon, revealing the presence and distribution of nanoscale crystalline grains. EDS elemental mapping is also presented for the region shown in (c), highlighting the local chemical distribution. (d) Quantitative phase fractions determined for the analyzed condition.

Figure 1. (a) X-ray diffraction (XRD) pattern and (b) selected-area electron diffraction (SAED) pattern obtained by transmission electron microscopy (TEM), highlighting the coexistence of amorphous and crystalline fractions.

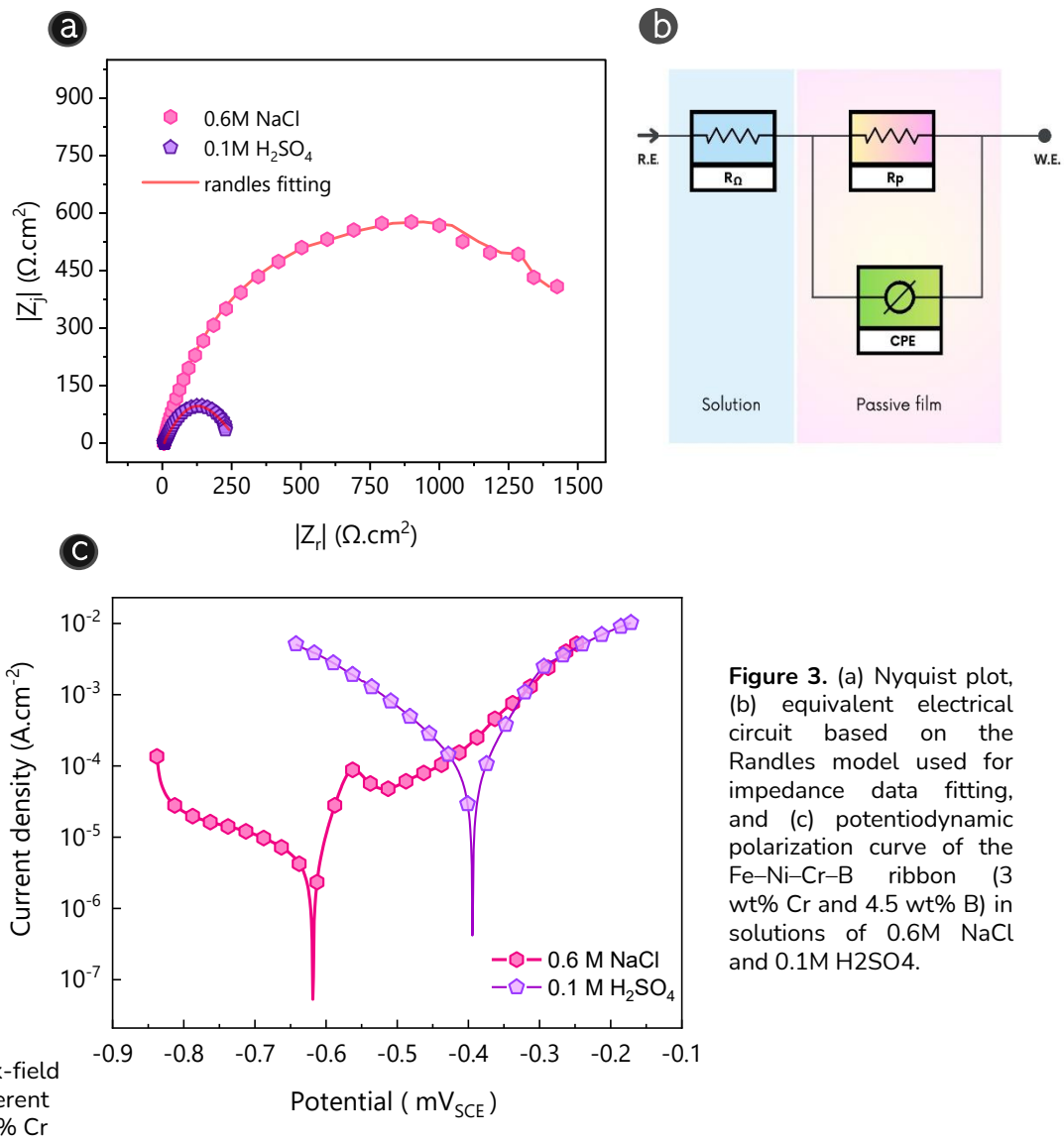


Figure 3. (a) Nyquist plot, (b) equivalent electrical circuit based on the Randles model used for impedance data fitting, and (c) potentiodynamic polarization curve of the Fe–Ni–Cr–B ribbon (3 wt% Cr and 4.5 wt% B) in solutions of 0.6M NaCl and 0.1M H2SO4.

Conclusions / Conclusão

- Despite the relatively high B content (4.5 wt%), the ribbons did not achieve a fully amorphous structure, potentially due to processing limitations, including equipment efficiency.

- Nanometer-sized crystalline grains were observed, with no significant compositional variations.

- The partially amorphous structure exhibited poor corrosion resistance, particularly in 0.1 M H_2SO_4.

Acknowledgments / Agradecimentos