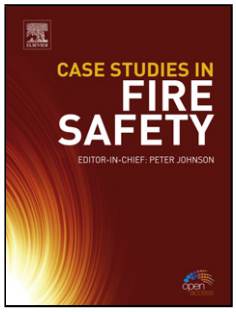

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Corrosion behaviour of CoCrMo alloy fabricated by electron beam melting

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Highlights

- Corrosion behavior of EBM-CoCrMo alloy in lactic acid solution was studied;
- The alloy is characterized by columnar γ phase along build direction;
- Numbers of grain boundary and σ phase vary with build direction;
- Grain boundary and second phase lower the corrosion resistance;
- Crystalline orientation has a minor effect on the corrosion behavior.

Abstract

Electrochemical and static immersion tests in 1 mass% lactic acid solution are performed to investigate the corrosion behaviour of CoCrMo alloy fabricated by electron beam melting with cylindrical axes of samples deviating from build direction by 0°, 45° and 90°. All samples are dominantly composed of columnar γ-fcc phase with preferred crystal orientations. 90° sample, characterized by the largest grain size, lowest grain boundary density and fewest Cr-rich σ phase precipitates, demonstrates