Effet des traitements thermiques sur le comportement microstructural et mécanique de l'acier inoxydable Lean duplex 2101 lors du vieillissement

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Abstract: As part of this project of memory we propose by this work a study on the microstructural and mechanical behavior of a stainless steel Lean Duplex LDSS 2101 during heat treatments realized in two stages: a treatment of dissolution at a temperature of 1050 ° C for one hour then water quenching, followed by an aging treatment at 720 ° C at different holding times (T = 10min, 60min, 10h, 24h, 120h, 240h) followed by quenching to water.The different samples are metallurgically characterized by optical microscopy and scanning electron microscopy (SEM). XRD analysis was used to identify the phases and precipitates formed during the treatments. Thermal treatments have significantly affected the phase equilibrium of stainless steel, caused by nitrides and carbides precipitation phenomena.Micromechanical characterization was performed by nano-indentation tests for the measurement of hardness and Young's modulus for each phase for the different samples.

Keywords : stainless steel Lean Duplex LDSS 2101