World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Thermo-Mechanical Treatment of Chromium Alloyed Low Carbon Steel

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Abstract : Thermo-mechanical processing with various processing parameters was applied to 0.2%C-0.6%Mn-2S%i-0.8%Cr low alloyed high strength steel. The aim of the processing was to achieve the microstructures typical for transformation induced plasticity (TRIP) steels. Thermo-mechanical processing used in this work incorporated two or three deformation steps. The deformations were in all the cases carried out during the cooling from soaking temperatures to various bainite hold temperatures. In this way, 4-10% of retained austenite were retained in the final microstructures, consisting further of ferrite, bainite, martensite and pearlite. The complex character of TRIP steel microstructure is responsible for its good strength and ductility. The strengths achieved in this work were in the range of 740 MPa – 836 MPa with ductility A_{5mm} of 31-41%.

Keywords : pearlite, retained austenite, thermo-mechanical treatment, TRIP steel
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020