

Isotope exchange investigation of nitrogen redistribution in expanded austenite - DTU Orbit (07/08/2016)

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Sequential plasma and gaseous nitriding of Fe–18Cr–10Ni–3Mo stainless steel at 390°C with 14N and 15N isotopes followed by denitriding in flowing hydrogen was investigated. Redistribution of plasma-inserted nitrogen atoms (15N) by subsequent gaseous nitriding (14N) was observed. Denitriding after plasma- and gaseous nitriding resulted in predominant retraction of 14N, and only a minor amount of 15N. The nitrogen isotope diffusion behaviour is explained by two different states of nitrogen bonding and short-range ordering between nitrogen and chromium.

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