Tantalum-containing Z-phase in 12%Cr martensitic steels

Z-phases in tantalum-containing 12%Cr steels have been investigated. In 12%Cr steel without any Nb or V, the formation of CrTaN Z-phases was observed. In 12%Cr steel which also contained V, the Ta entered Z-phase as a minor element, Cr(V,Ta)N. The crystal structure of Cr(V,Ta)N seems to be identical to CrVN Z-phase, while CrTaN is similar to CrNbN Z-phase but with a different lattice parameter.