

## Mechanism and Kinetic of Layers Growth: Application to Nitriding of 32CrMoV13 Steel

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**Abstract :** In this work, our task consists in optimizing the nitriding treatment at low-temperature of the steel 32CrMoV13 by the way of the mixtures of ammonia gas, nitrogen and hydrogen to improve the mechanical properties of the surface (good wear resistance, friction and corrosion), and of the diffusion layer of the nitrogen (good resistance to fatigue and good tenacity with heart). By limiting our work to the pure iron and to the alloys iron-chromium and iron-chrome-carbon, we have studied the various parameters which manage the nitriding: flow rate and composition of the gaseous phase, the interaction chromium-nitrogen and chromium-carbon by the help of experiments of nitriding realized in the laboratory by thermogravimetry. The acquired knowledge have been applied by the mastery of the growth of the combination layer on the diffusion layer in the case of the industrial steel 32CrMoV13.

**Keywords :** diffusion of nitrogen, gaseous nitriding, layer growth kinetic, steel

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