INVENTIONS

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RAPID BARFFING OF SINTERED STEELS

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Technology and equipment for an ecologically pure process of rapid barffing in a fluidized bed created by steam at a heating rate $v_h > 0.5$ K/sec have been created [1 – 5]. The process increases the corrosion strength of sintered steels by a factor of 8 and reduces the treatment time by a factor of 12.

We discovered an earlier unknown phenomenon of formation of composite oxide phases of a variable composition that contain predominantly (85 – 97%) impurity elements the proportion of which in the charge is 2 – 3 orders of magnitude lower than that of the matrix, i.e., iron. This phenomenon was classified as a scientific discovery [3] and registered as "the phenomenon of formation of composite oxide phases of variable composition in pores of sintered steels." The discovery is formulated as follows. "The discovered, earlier unknown phenomenon of formation of variable-composition composite oxide phases in pores of sintered steels consists in the fact that when a sintered steel is oxidized at a high temperature ($t > 400$°C) in a medium of superheated steam, there chiefly form oxides of impurity elements (Mg, Al, Si, Mn) which possess a higher affinity for oxygen than iron and are contained in the alloy in an amount 2 – 3 orders of magnitude lower than that of iron, due to the diffusion of the impurity elements to the surface of contact between the oxidizer and the developed oxidizing surface through capillary pores."

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