

Surface Modification of Ferritic Steels Using MEVVA and Duoplasmatron Ion Sources

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Metal Vapor Vacuum Arc (MEVVA) ion source is a unique tools for production of high intensity metal ion beam that can be used for material surface modification. From other hand the duoplasmatron ion source provides the high intensity gas ion beams. The MEVVA and Duoplasmatron ion sources developed in Institute for Theoretical and Experimental Physics (ITEP) were used for the reactor steel surface modification experiments. Response of ferritic-martensitic steel specimens on titanium and nitrogen ions implantation and consequent vacuum annealing is investigated. Increase in microhardness of near surface region of irradiated specimens is observed. Local chemical analysis shows atom mixing and redistribution in the implanted layer followed with formation of ultrafine precipitates after annealing.