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**Analysis of hydrogen retention with nonlinear reaction-diffusion equations** J. GUTERL, R.D. SMIRNOV, S.I. KRASHENINNIKOV, UCSD — The nonlinear reaction-diffusion equations are rather widely used for the assessment of hydrogen trapping in plasma facing components of magnetic fusion devices. Depending on the sophistication of the model different species (e.g. free and trapped hydrogen, interstitials, clusters, etc.) are considered. However, so far no attempt to study general properties of the solutions of these equations was made. Here we present the results of the analysis of general time-dependent solutions of the nonlinear reaction-diffusion equations for the simple case of evolution of basic species (free and trapped hydrogen and mobile trapping sites) in the bulk wall material. The hydrogen implantation, desorption, wall erosion and co-deposition processes are included in the consideration. We compare our results with available experimental data on the dependences of hydrogen retention in beryllium on the depth and the sample's temperature.

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