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The ductility of $\alpha + \beta$ titanium alloys over a wide range of strain rates and stress triaxiality VLADIMIR V. SKRIPNYAK, EVGENIYA G. SKRIPNYAK, IRINA K. VAGANOVA, NATALIA V. SKRIPNYAK, VLADIMIR A.. SKRIPNYAK, National Research Tomsk State University — This paper presents the results of experimental research and numerical simulation of mechanical behavior of alpha + beta titanium alloys VT–6 (this is an analog of alloy Ti–6Al–4V) and BT–5 (this is an analog of Ti–5Al) in a wide range of strain rates (from 0.001 to 1000 1/s) and stress triaxiality (0.025–0.6). Samples of different shapes were used in experiments to study the deformation and fracture under uniaxial tension, shear. The model of inelastic deformation and fracture is proposed to describe the ductility of the titanium alloy in a wide range of strain rates and stress states. The model was calibrated using experimental data for alpha + beta titanium alloys at room temperature. The model describes the ductility of the alpha + beta titanium alloys at temperatures below˜873 K when the volume concentration of beta-phase varies slightly.

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