REGULARITY OF 1D COMPRESSIBLE ISENTROPIC NAVIER-STOKES EQUATIONS WITH DENSITY-DEPENDENT VISCOSITY

We consider one-dimensional compressible isentropic Navier–Stokes equations with the viscosity depending on density and with free boundary. The viscosity coefficient μ is proportional to ρ^θ with $0 < \theta < 1$, where ρ is the density. The existence and uniqueness of global weak solutions in $H1([0, 1])$ have been established in S. Jiang, Z. Xin, P. Zhang in 2005. We will establish the regularity of global solution under certain assumptions imposed on the initial data by deriving some new a priori estimates.