For the first time the low frequency relaxation process in two smectic phases (smectic A and smectic C) was studied at elevated pressures with the aid of DTA and dielectric spectroscopy. The substance studied, 2-(4-hexyloxyphenyl)-5-octyl-pyrimidine (6OPB8 in short) exhibits the nematic (N) – SA – SC phase sequence. The \(p-T\) phase diagram was established with DTA. However, the SA – SC transition was not observed in the DTA, but could be detected by dielectric relaxation measurements. The dielectric relaxation time measured as function of temperature and pressure, \(\tau(\rho, T)\), enabled us to calculate the activation volume, \(\Delta V = R T (\partial \ln \tau / \partial \rho)_{T}\), and activation enthalpy, \(\Delta H = R (\partial \ln \tau / \partial T)_{\rho}\). It was found that \(\Delta V(SA) > \Delta V(SC)\) and \(\Delta H(N) \gg \Delta H(SA) > \Delta H(SC)\), indicating that the molecular rotations around the short axes are more feasible in the tilted SC than in the orthogonal SA phase.

Key words: Liquid Crystal; Dielectric Relaxation; \(p-T\) Phase Diagram; High Pressures.