1018-65-256 **Sirikul Bunditsaovapak** (y_honey_t@hotmail.com), Dept. of Mathematics and Computer Science, Faculty of Science, King Mongkut's Inst. of Tech. Ladkrabang, 10520 Ladkrabang, Bangkok, Bangkok, Thailand, and **Saitharn Thenissara*** (saitharn@gmail.com), Department of Mathematics, Faculty of Science and Liberty Arts, Rajamangala University of Technology Isan, 30000 Nakornratchasima, Nakornratc, Thailand. *The Effect of Surface Tension on the Swell Ratio of Viscoelastic Fluid.*

This paper presents the die-swell problem for viscoelastic fluid by using the finite element methods (FEM) under the semi-implicit Taylor-Galerkin pressure correction principle with consistent streamline upwinding. The assumptions of incompressible fluid, constant gravitation, temperature independence and no slip effect are used. The two-dimensional models, in which the equations are nonlinear partial differential equations, are governed by the conservation of mass, conservation of momentum, and Oldroy-B model. The deformation of fluid at free surface is affected by surface tension force, thus both dynamic and kinematic boundary conditions are considered. Evolution of die-swell flow: the variation of velocities, pressure, stresses, shear rate and extension rate. The simulation program has been created to generate grid and compute the solutions. Remeshing and interpolating techniques as well as the gradient recovery are utilized in order to increase accuracy and stability of the solutions. The results exhibit the same trend as the experimental solutions. (Received March 07, 2006)