1106-86-1827 **T. Malysheva*** (malysheva@ou.edu) and **L. White** (lwhite@ou.edu). *Well Posedness Theory for a Coupled Thermo-Chemo-Poroelastic System.* Preliminary report.

We will present the well posedness theory for a coupled thermo-chemo-poroelastic (TCPu) system. This study is motivated by the problems of borehole stability in fluid-saturated chemically active porous formations that involve the modeling of fully coupled thermal, chemical, hydraulic, and mechanical processes. The underlying TCPu model is a system of time-dependent parabolic partial differential equations (PDEs) coupled with Navier-type elliptic PDEs with time as a parameter. The parabolic equations represent heat, solute, and fluid diffusions, and the Navier-type elliptic equations attempt to capture the elastic behavior of rock while incorporating thermal, chemical, and porous media effects. The well posedness results are based on the Faedo-Galerkin approximation of the parabolic system and on the principle of the minimum total potential energy with Korn's inequalities applied to the elastic Navier-type system. (Received September 15, 2014)