

## **DRYING KINETICS ANALYSIS IN ENGINEERING GEOLOGY**

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Water is the main actor in geomechanics. When is inside soils and rocks it can be inducing hydrostatic pressures or it can be related with boundary effects such as surface tension and acting as a strength provider via suction effects. It is also connected with chemical weathering. In the drying processes, the movement of the water from the inside to the surface and the atmosphere bring a whole set of dynamics to the structure and behaviour of the geomaterials. To understand such changes through time whilst drying first of all it is necessary to have a look on the kinetics of the drying processes.

Silica-gels were produced in the laboratory and a drying study under controlled environments was followed. In a general way the drying process is shown to involve a two stage mechanism, as follows: in the first stage an evaporation process (activation energy of 41.2 kJ/mole) and in the second one a diffusion-controlled process (activation energy of 36.2 kJ/mole). It also can be involved an intermediate stage with a mixture of the two described drying processes.

In the evaporation stage occurs the so called constant rate period, CRP, where the rate of the evaporation is independent of time; during the CRP most of the shrinkage occurs and the drying stresses become the greatest; at the end of the CRP the Critical Moisture Content, CMC, is defined. Then it follows the transition stage and after that the diffusion stage appears where the rate of drying is strongly time dependent.