Study of the evaporation of saline solution in porous media

Bouguerra Nawel, Sghaier Nour et Ben Nasrallah Sassi

**Abstract:**

The phenomenon of crystallization of salts is accompanied by an increase in the volume of crystals in the pores. This generates a pressure which is sufficient to cause a considerable deterioration of porous materials such as building bricks and monuments.
Salt crystals can take place at the surface of the materials, and this is called efflorescence. However,it can also take place inside the material, which is known as subflorescence.
This work presents an experimental study to determine the effects of environmental conditions (temperature and relative humidity) on the structure of efflorescences and on the kinetics of evaporation during drying an NaCl solution on a hydrophilic glass plates.
These efflorescences have porous structures where the porosity and the pore sizes are influenced by the rise of temperature and by the relative humidity.
At a fixed humidity and for different values of temperature, efflorescences , that form, have branched structures that are two-dimensional at the beginning of crystallization and almost three-dimensional at the end of crystallization.
Otherwise, the increased humidity promotes the formation of three-dimensional structures and the formation of lamellae in the efflorescences.