

# SEM-INVESTIGATIONS ON THE MICROSTRUCTURE OF STEAM CURED BUILDING MATERIALS

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## **ABSTRACT**

Hydrothermally hardened building materials are characterized by high compressive strength and –if of porous texture- good thermal insulation properties and workability. By the efforts to lower the energy consumption at the expense of fossil fuels heat insulating building materials gain increasingly in attractiveness.

In addition to the characteristics specified above further demands on the building material are placed. The quality of hydrothermally hardened building materials depend substantially on the chemical and mineralogical composition of the raw materials.

Previous investigations on these topics [ 1-3 ] showed that shrinkage (as one example) is strongly determined by the crystallinity of the 1,13 nm tobermorite, which is the main binding phase in most hardened materials. The scope of this work is twofold:

- Influence of the foreign cations  $Al^{3+}$  and  $K^{+}$  on the basic system  $CaO-SiO_2-H_2O$ .
- Application to industrially relevant systems

The samples were investigated by means of scanning electron microscopy (SEM), energy disperse x-ray-fluorecense (EDX) and electron microprobe analysis (EMPA).

Additionally x-ray diffraction and mercury intrusion porosimetry were applied to the hardened material.

The influence of the mineralogical phase composition and the microstructure on the physico- mechanical properties of the material is presented by selected examples.