

# **WATER-INDUCED CREEP OF SALTS IN THE PRESENCE OF ADDITIVES**

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Wetting of grain boundaries in polycrystalline materials leads to considerable changes in their rheological properties. Under a constant compressive load, internally wetted materials display an enhanced deformability: creep rate increases sometimes by several orders of magnitude. The dominant creep mechanism is widely known as dissolution-precipitation or pressure solution. Sensitivity of pressure solution rate to the chemical composition of the intergranular liquid was reported earlier, but the underlying mechanisms are still poorly understood. In the present work, the creep experiments were carried out on poly- or monocrystalline sodium chloride or calcium carbonate in the presence of their saturated aqueous solutions containing additives: bivalent metal chlorides, potassium ferrocyanide, amines, amides or phosphonic acids. The creep has been shown to slow down or even to stop in the presence of additives which are known to affect the dissolution or growth processes of a given material, its solubility or diffusivity in the water solution. In some rare cases an additive accelerates the pressure solution creep. Rate-limiting stage (dissolution or diffusion) in various environments has been identified. For calcium carbonate – water – 1-hydroxy ethylidene-1,1-diphosphonic acid system, a quantitative correlation between surface coverage in ICP-AES dissolution experiments and rheological tests has been found.