Determination of elastic and diffusive properties of a Calcium-Silica-Alkali hydrogel through macroscopic indentation.

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ABSTRACT: Synthetic gels aiming to reproduce those found in alkali-reaction affected structures have been created, following works of F. Gaboriaud (Journal of Non-Crystalline Solids, 2006). The purpose of our experiment is to identify the elastic and diffusive properties of such hydrogels in order to have a better idea of the pressure build-up in the porous space of the concrete where such gels appear. The drained and undrained elastic properties are derived from slow and fast experiments, while intermediate speeds help quantifying the properties of solution transport in the gel porous space. Different chemical compositions and ages are tested. This experiment has been applied to other similar gels (Journal of Non-Crystalline Solids, 2006), and seems well adapted to our gels. To our knowledge it gives the first results about the drained properties of such gels.