

It is usually assumed that chlorinated solvent nonaqueous-phase liquids (NAPLs) are nonwetting with respect to water-saturated porous media. The focus of this work was to examine whether this supposition is appropriate for used trichloroethylene (TCE) samples. In this work, the term "used" indicates that the sample has been employed industrially and therefore contains solutes and breakdown products related to its previous use. The data obtained in this study indicate that exposure of initially water wet quartz slides to industrially used solvents can cause a contact angle change, measured through the aqueous phase, of 100 degrees with a maximum stable contact angle of 170 degrees (indicative of strong NAPL wetting characteristics) being recorded. The work on quartz slides was complemented by the use of sandstone cores. Wettability was measured using the Amott test. Used TCE again proved able to alter the wetting properties of sandstone to neutral wetting. The complexity of the industrially used samples precluded any realistic attempt to examine the agents causing these wetting changes. The data captured in these experiments were compared with laboratory grade TCE, and some attempts were made to synthesize known mixtures in order to replicate wetting changes. These experiments resulted in contact angle changes but did not alter the overall wettability of the quartz slides or sandstone cores. Finally the work reported here also demonstrates that increasing the duration of exposure to solvent has an important impact upon measured contact angle.