Fact Sheet

Softening of Rigid PVC by Aqueous Solutions of Organic Solvents

BACKGROUND

Although PVC well casings are suitable for most monitoring applications, it is commonly known that PVC cannot withstand exposure to neat (undiluted) organic chemicals that soften or dissolve it. However, it was not known what effect aqueous solutions containing these chemicals have on rigid PVC.

FINDINGS

The ability of an aqueous solution is related to the ability of the neat (undiluted) chemical to dissolve or soften PVC and its relative solubility (concentration of analyte in test solution divided by the aqueous solubility of chemical).

- Solutions containing a single PVC solvent with a relative solubility less than 0.1 did not affect PVC, even after long-term (18 months') exposure.
- Higher relative solubilities were needed to see the same effects in a solution that contained a swelling agent (vs. one that contained a PVC solvent).
- Softening does not occur when the combined or total relative solubilities of the analytes in the test solution are less than 0.1.

PUBLICATIONS

Parker, L.V., and T.A. Ranney (1994) Softening of rigid PVC by aqueous solutions of organic solvents. U.S. Army Cold Regions Research and Engineering Laboratory, Special Report 94-27.

Parker, L.V., and T.A. Ranney (1995) Additional studies on the softening of rigid PVC by aqueous solutions of organic solvents. U.S. Army Cold Regions Research and Engineering Laboratory, Special Report 95-8.

Parker, L.V., and T.A. Ranney (1996) Further studies on the softening of rigid PVC by aqueous solutions of organic solvents. U.S. Army Cold Regions Research and Engineering Laboratory, Special Report 96-26.

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