1. A subsurface vadose zone is observed to be contaminated with chlorobenzene. The samples taken from the contaminated sites exhibit a total chlorobenzene contamination of 450 mg/kg soil. Soil bulk density is 1.8 g soil per cm3. The total porosity is 0.35 cm3/ cm3 and the volumetric water content is 0.11 cm3/cm3. The foc is 0.02. Assume that the subsurface temperature is 25 oC.
2. Estimate percent mass distribution of chlorobenzene in each phase
3. Estimate the concentration of 1,1-dichloroethane in each phase in terms of mg/m3.
4. Determine if there is any NAPL. Note that the maximum solubility limit of chlorobenzene in water is 488 mg/L.
5. The design engineer is planning to use an SVE system to remediate the site. The contaminated vadose zone has a total soil volume of 20 000 m3. The engineer wants to use 20 extraction wells each with an airflow rate of 100 Lpm. Based on design parameters, how long will it take to achieve 80 %mass removal from this site?