Retardation factor of chlorobenzene and 1,3,5-trichlorobenzene

Calculate the retardation factor, $R_{f\,i}$, of chlorobenzene and 1,3,5-trichlorobenzene (1,3,5-TCB) in an aquifer at 10°C. (Note that the retardation factor is identical to the inverse fraction of compound in the mobile phase $R_{f\,i} = f_{iw}^{-1}$ if sorption equilibrium is attained; see Box 13 in the textbook).

Assume that retardation is determined by absorption to the aquifer solids' POM. The average organic carbon content of the aquifer material is 1.1 % (f_{oc} = 0.011). The minerals can be assumed to have a density of 2.5 kg L^{-1} and the porosity is 0.33. Sorption coefficents at 10°C:

a) chlorobenzene: K_{ioc} =160 L kg_{oc}^{-1}

b) 1,3,5-TCB: K_{ioc} =1780 L kg_{oc}^{-1}

Answer:

a) 10

b) 100

- Excercises for an improved intuitive understanding
- Questions for recapitulation
- Good to know
- Minesweeper-problems