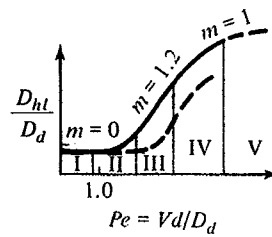


(a)



(b)

Figure 7-4 Relationship between molecular diffusion and hydrodynamic dispersion (after Pfannkuch, 1963; Saffman, 1960).

occupied by a considered α phase (water in unsaturated flow) which, in turn, is a function of the saturation. Similarly, the components \bar{T}_{ij}^* of the tortuosity tensor are also a function of the saturation. Hence, when we consider unsaturated flow in an isotropic medium, we have to verify that the isotropy of \bar{T}^* remains for all saturations.

Let us summarize the various dispersion coefficients:

$$D_{hij} = D_{ij} + (D_d^*)_{ij} = \text{coefficient of hydrodynamic dispersion,}$$

$$D_{ij} = \text{coefficient of mechanical (or convective) dispersion,}$$

Ref.: Bear, J., *Hydraulics of Groundwater*, McGraw-Hill, 1979