

Imbibition in Customized Systems of Packed Beads

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The movement of liquid through porous media was described about a century ago. The dynamic observed describes the position of the meniscus of the liquid as the square root of the time over which the movement occurred. The movement of liquid also occurs in multilayered systems such as soils and bioreactors in chemistry and bioengineering. The dynamics of silicone oil which is ten times thicker than water, was studied in bi-layers systems. The invasion of the liquid into a tube filled with beads was recorded. The position of the meniscus in the first layer made of small beads, behaved as the square root of the time. In the second layer, which is constituted of larger beads, a constant velocity is observed. The constant velocity in the second part is due to the fact that most of the friction exerted by the liquid on the wall occurs in the smaller beads (see Figures 1 and 2).

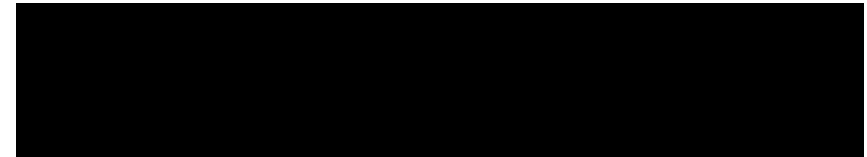


Figure 1: Tube filled with 2 layers of beads of different sizes

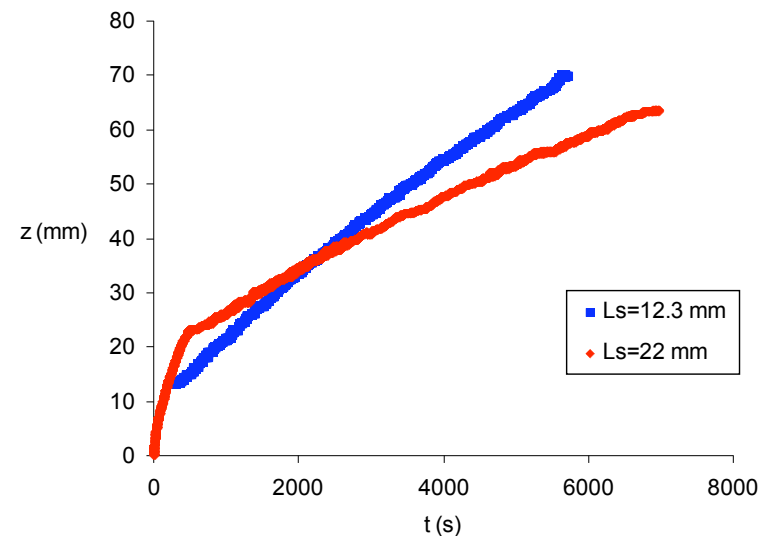


Figure 2: Plot of the position of the meniscus versus the time.

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