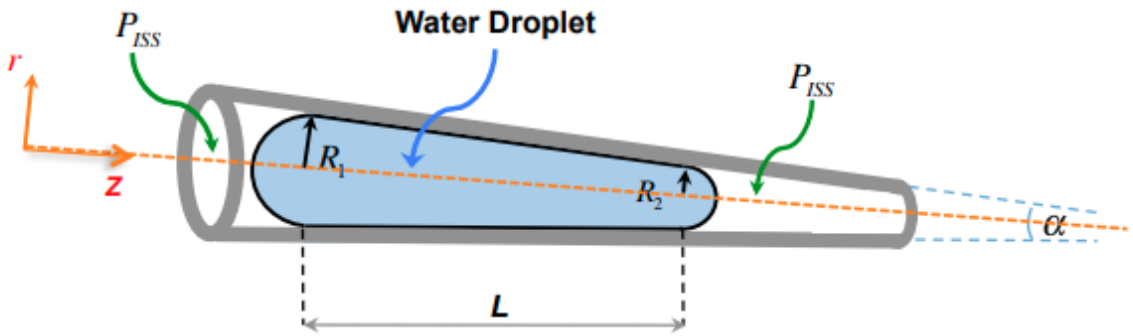
Consider a specially made capillary, shown in the illustration below, designed for an experiment on the International Space Station. Capillary has a variable diameter and is open at both ends to a cabin pressure at ISS. A perfectly smooth glass walls appear to be ***completely hydrophobic*** with respect to a droplet of water positioned In the middle of the capillary.

Data

R_1 =300 [μm]; R_2 =295 [μm]; L= 0.03 [m]; μ_{water}=0.001 [Pa s]; ρ_{water} =1000 [kg/m^3] ; $\sigma_{water\text{-}air}$ =0.072 [N/m].

Illustration



Capillary is open at both ends.

(Show all your work; and, state all assumptions that you have made)

a) Which way the bubble will move as it is observed at the location shown in the illustration below:

☐ from left to right ☐ from right to left

Why:

b) Calculate the velocity of the droplet at the location shown in the illustration?