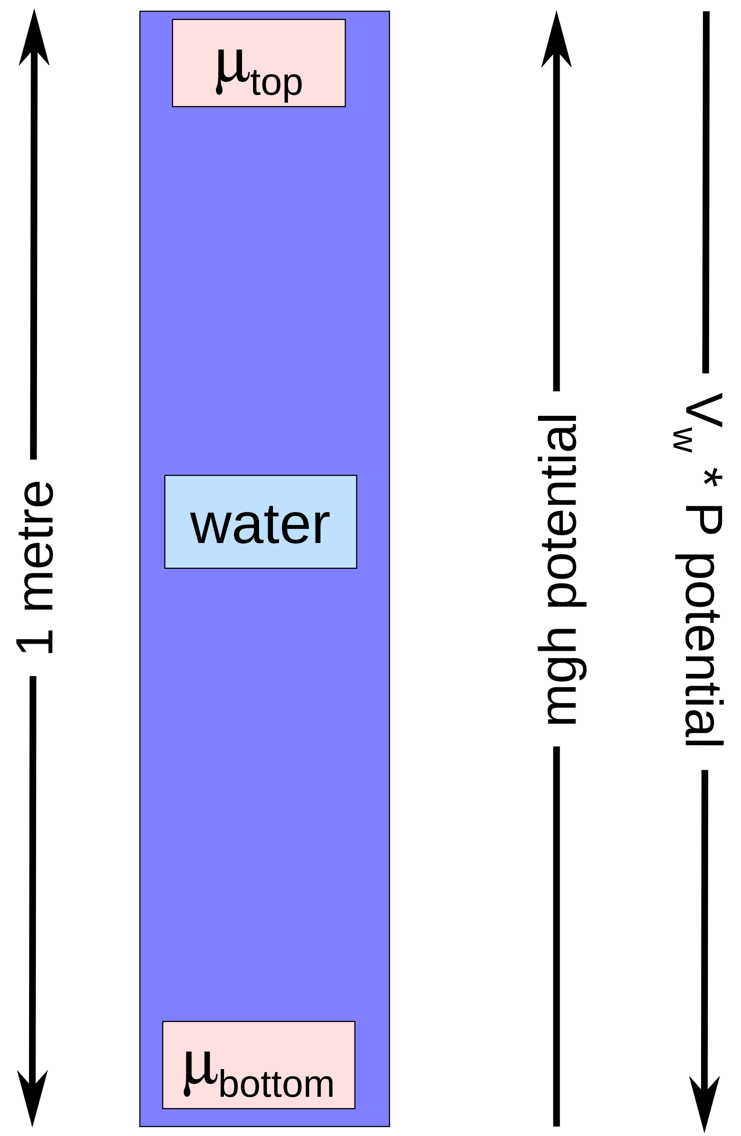
A water filled tube: what are its energetics?



Working now with potentials in terms Ψ (units of pressure: Nm^{-2}) instead of the units of μ ($Jmol^{-1}$);

$$\Psi = \mu/V_w$$

units: $Nm^{-2} = Jmol^{-1}/m^3mol^{-1} = Nm^{-2}$

how do the Ψ components due to height and hydrostatic pressure change change with height?

The height component (derived from mgh):

$$\Psi_{height} = \rho_w gh$$

The hydrostatic component:

$\Psi_{hydrostatic} = \rho_w g(1-h)$ (ie distance from top)

total potential at any point h is:

$$\Psi_{total} = \Psi_{height} + \Psi_{hydrostatic} = \rho_w gh + \rho_w g(1-h) = \rho_w g$$

so potential is the same throughout the column and there is no movement of water.