King Saud University **CE 442 Water & Wastewater Treatment**
College of Engineering **2nd Semester 1428-1429H / 2007-2008G**
Civil Engineering Department **Section: 6316**

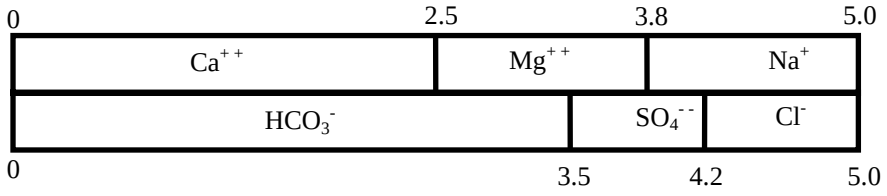
Home Work No. 6

(1) A rapid sand-filter plant is to treat a maximum flow of 1800 m^3/h at a nominal filtration rate of 6 $m^3/m^2.h$.

(a) Determine the minimum number of filters that are required and the individual filter area if the filtration rate is not to exceed 10 $m^3/m^2.h$ with one filter out of service and one filter being backwashed.

(b) How much water is required to wash the filters if the backwash rate is 25 $m^3/m^2.h$ and the duration is 10 minutes?

(2) The meq/L bar graph of a groundwater is shown below



(a) Determine the amount of chemical (s) needed to remove the calcium hardness.

(b) What would be the final hardness of this water after treatment?

(c) What is the amount of sludge that would be produced (g/m^3)?