7.2 Hard Water Treatment

Definitions

- Soda-lime process
- Hard water
- Soap
- Detergent

Hard Water

- Water that contains higher than normal concentrations of $Ca^{2+}_{(aq)}$, $Mg^{2+}_{(aq)}$, $Fe^{2+}_{(aq)}$, $Fe^{3+}_{(aq)}$, and $Mn^{2+}_{(aq)}$.
- The source of the ions is the rock that rainwater percolates through on its way to the water table.
- Hard water prevents soap from working properly. Produces soap scum instead of a micelle.

Water Softening

- Water softening can be done on a municipal level as described in a previous chapter using sodium carbonate and calcium hydroxide (soda-lime process).
- In our area people are responsible for the softening of their own water supply.
- A home water-softening unit contains an ion exchange resin that exchanges $Na^{2+}_{(aq)}$ ions from the resin for $Ca^{2+}_{(aq)}$ found in the water. Eventually the resin fills with $Ca^{2+}_{(aq)}$ ions and needs to be regenerated. Sodium chloride is used to regenerate the resin.
- People on sodium-reduced diets should consider using potassium chloride.

Homework

- Practice 1-5
- Section 1-5