

Question 3: 1000 kg of freshly extracted orange juice contains 12.5% solids. This juice is strained, yielding 800 kg of strained juice and 200 kg of pulpy juice. The strained juice is concentrated by vacuum evaporation to give an evaporated juice containing 58% solids. This evaporated juice is mixed with the pulpy juice to improve flavor, resulting in a concentrate of 42% solids.

Find:

- i) Concentration of solids in strained juice.
- ii) Mass of water evaporated.
- iii) Concentration of solids in the pulpy juice.

Pre-problem Thoughts:

1. What are the components?
2. What are the subsystems?
3. What are the streams?
4. What type of balance should be performed?
5. Steady-state vs. unsteady-state and reactive vs unreactive.