Evaporation Quiz 2017

Revision prompts

These questions are to assist in revision for your exam and are intended for use in conjunction with the lecture notes and tutorial material available to you through your lectures and the 280.371 stream site

1 Why is evaporation an important process operation?

2 Give examples of the use of evaporation in 4 different industries.

3 List 3 alternatives to evaporation (processes for removing water from a feedstock).

4 List the major mechanical components of an evaporator.

5 What are the main utilities used in an evaporation process?

6 What are the options for dealing with the vapour produced in an evaporator?

7 List the benefits of using steam for primary heating.

8 With food products why is it desirable to limit operating temperature?

9 Draw a schematic diagram of a single effect evaporator; show all streams.

10 Explain what is meant by TVR.

11 Explain what is meant by MVR.

12 Draw a schematic diagram of a single effect evaporator using MVR

13 What is meant by the term “Heat of mixing”?

14 What is meant by the term “non-condensible gas”?

15 List the key factors relating to the solution, when it is to be processed in an evaporator.

16 List the major design factors to be considered when designing an evaporator or selecting one for a particular application.

17 Draw a sketch of a single tube in a falling film evaporator.

18 What is one of the major applications of a falling film evaporator?

19 When would you use a wiped film evaporator? Give one example.

20 List the advantages and disadvantages of a forced circulation evaporator.

21 List the major applications of forced circulation evaporators.

22 List the advantages and disadvantages of direct and indirect heat transfer in the condenser (water spray/ heat exchanger).

23 Draw a schematic diagram of a 3 effect feedback evaporator.

24 Derive Equation (10). Show your working.

25 Derive and solve mass and energy balance equations around a single stage and multi-stage evaporator

26 Understand and explain the implications of boiling point rise

27 Estimate boiling point rise using a During chart.

28 Be able to estimate the heat exchanger area for a single stage evaporator or for an effect in a multi-stage evaporator.

APV Evaporator Handbook has useful information.