uOttawa

Département de génie chimique et biologique
Department of Chemical and Biological Engineering

CHG 3111 – Unit Operations
Winter 2018

Tutorial Practice Problems
Set 4: Liquid-liquid extraction

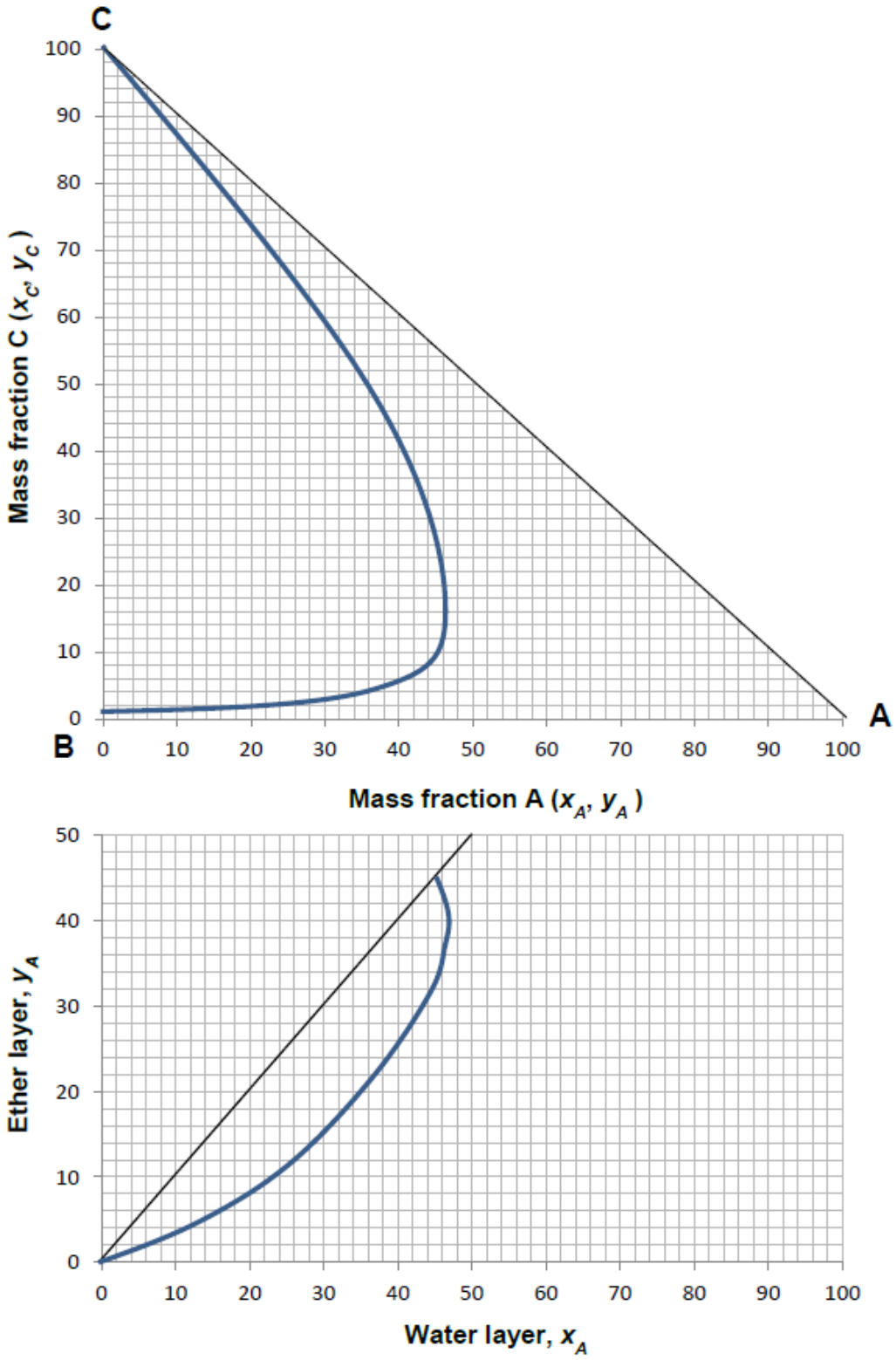
Problem 1

An aqueous feed solution of 100 kg/h containing 36 wt % acetic acid and 64 wt % water is being extracted by pure isopropyl ether in a countercurrent extraction process. The exit acetic acid concentration in the aqueous phase is to be 14 wt %.

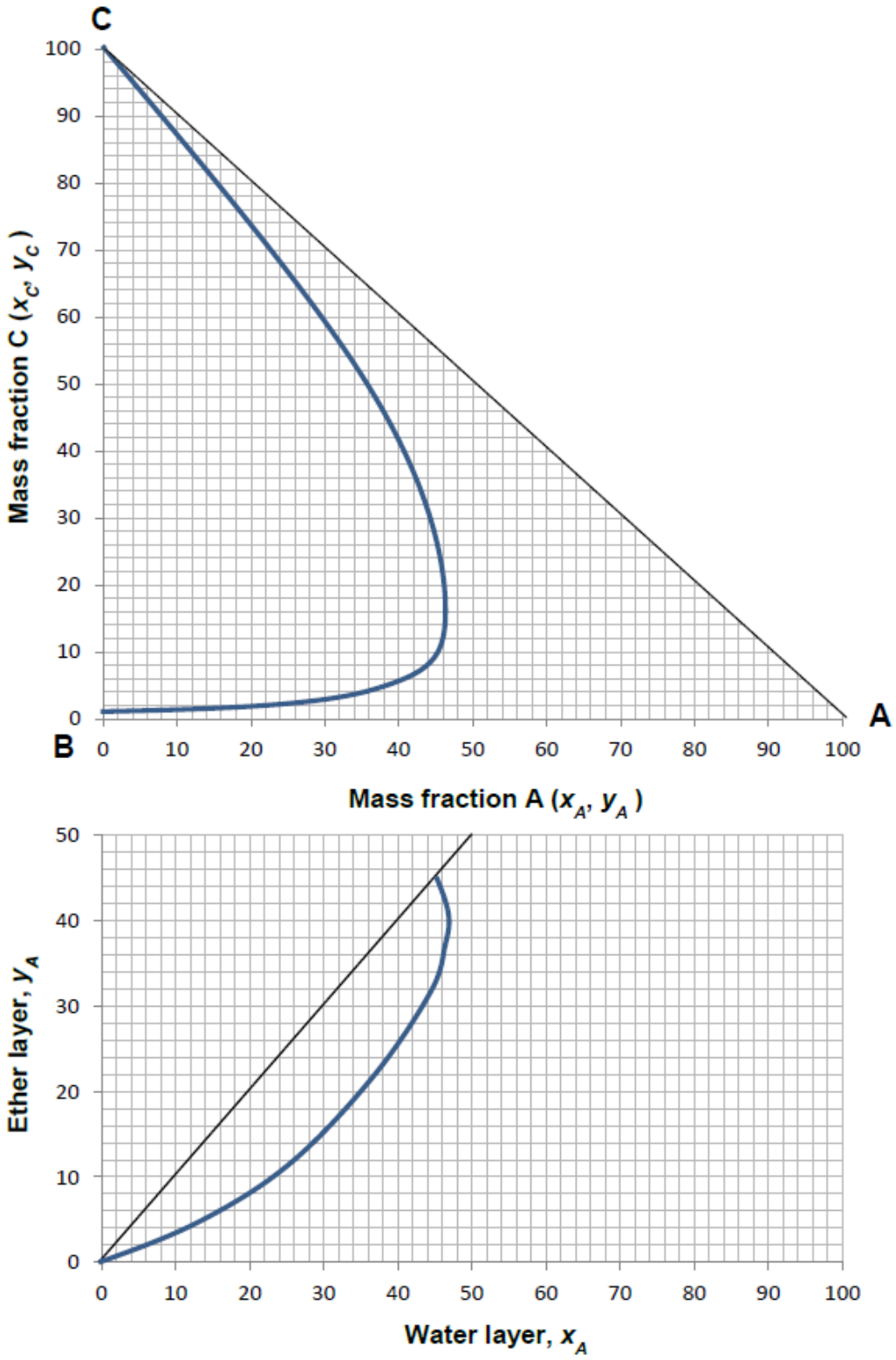
a) If the flow rate of pure isopropyl ether is 204 kg/h, how many equilibrium stages are needed to achieve the desired separation?
b) How much more of isopropyl ether would be required if the desired separation were achieved in one equilibrium stage?

Note: Considering that graphical solution has limited resolution, which may lead to a discrepancy in your final answer, it is advisable to describe in words the procedure you follow to solve this problem.

2 copies of acetic acid (A) – water (B) – isopropyl ether (C) liquid – liquid phase diagram at 20^{o}C are provided. You need one copy for part a) and one for part b)



Acetic acid (A) – water (B) – isopropyl ether (C) liquid – liquid phase diagram at 20°C



Acetic acid (A) – water (B) – isopropyl ether (C) liquid – liquid phase diagram at 20°C