淡江大學九十三學年度轉學生招生考試試題 45-1

系別：化學工程與材料工程學系三年級　　科目：質 能 均 衡

准帶項目請打「○」否則打「×」	
○	簡單型計算機

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本試題共 1 頁

(1) A labeled flowchart of a continuous steady-state two-unit distillation process is shown if Figure 1. Each stream contains two components, A and B, in different proportions. Three streams whose flow rates and/or compositions are not known are labeled 1, 2 and 3. Calculate the unknown flow rates and compositions of streams 1, 2 and 3. [35 pts]

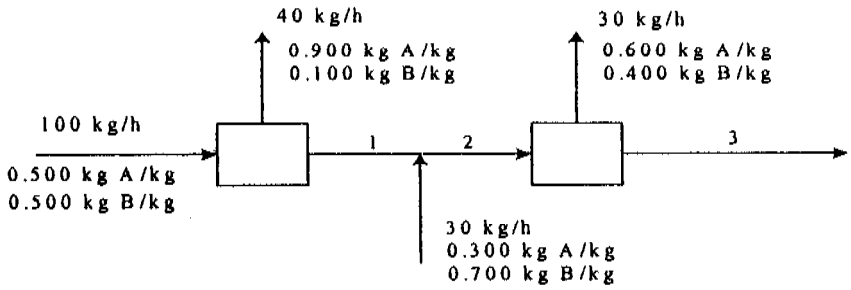

Figure 1

(2) In a wood drier the hot air must contain at least 2 weight percent water to prevent the wood from drying too rapidly and splitting or warping, as shown in Figure 2. The original fresh air fed contains 1 weight percent water. Wood is dried from 20 weight percent water to 5 weight percent water. The wet air leaving the drier contains 4 weight percent water. Calculate the amount of wet air that must be returned to the drier if $2000\,lb_m/hr$ of wet wood is dried. [35 pts]

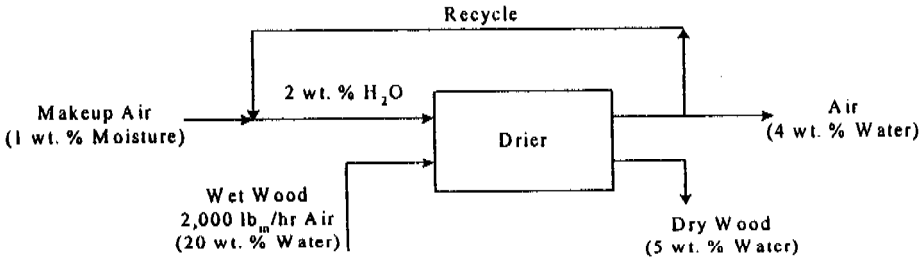

Figure 2

(3) Fuel oil (say, $C_{18}H_{36}$) is burned in 50 percent excess dry air (excess above that required for complete combustion to CO_2 and H_2O). The products of combustion are dried to remove all the water, as shown in Figure 3. Analysis of the flue gas shows a ratio of CO_2 to CO of 2, on a molar basis. Calculate the flue gas composition. [30 pts]

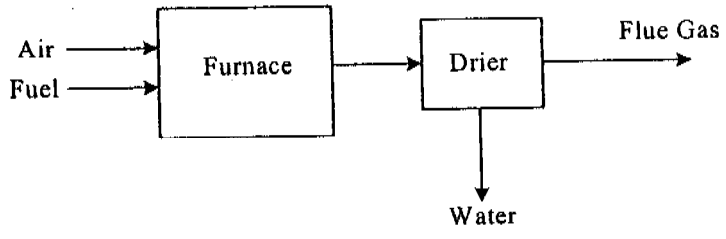

Figure 3