Department of Chemical Engineering

College of Engineering

King Saud University

CHE 407: Separation Processes
Second Semester (1439/1440 H)

LAB

DRYING EXPERIMENT

Tray Drier

DATE: / /

GROUP:……..

	ID	NAME
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Objectives

1. To produce drying and drying rate curves for a wet solid being dried with air fixed temperature.
2. To perform a mass balance for the air.

Experimental Data

Sample:…….

Air flow: Parallel

Heater power:……[W]

Number of Trays:……

Surface area for drying (A) =……. [m^2]

Mass of dry solid (L_S) =…….(kg)

Total mass of water =…….(kg)

Initial mass of wet solid =…….(kg)

Table 1: Experimental Data

Air					Wet Solid	
Inlet			Outlet			
Velocity (m/s)	Dry bulb Temp (^oC)	Wet bulb Temp (^oC)	Dry bulb Temp (^oC)	Wet bulb Temp (^oC)	Time [min]	Mass (g)

Exp. Supervisor Name:……. Signature:……

Table 2: The calculation Table

X_t=(Mass of wet solid-Mass of dry solid)/Mass of dry solid

Free moisture content= $X=X_t-X^*$(kg water/kg dry solid)

Where X^* is the equilibrium moisture content (kg water/kg dry solid)

R: Rate of drying [kg water/h m^2].

t(h)	X_t	X	Δt	ΔX	$\frac{\Delta X}{\Delta t}$	X (average)	$R = -(L_s/A)(\Delta X/\Delta t)$
	X^*						