

## TUTORIAL:01 - DATA EXTRACTION

Based on Lecture-04: **Data Extraction**

**Problem 1:** - A process flow diagram of a typical process is shown in Fig. 1. Extract data for hot and cold streams for this process.

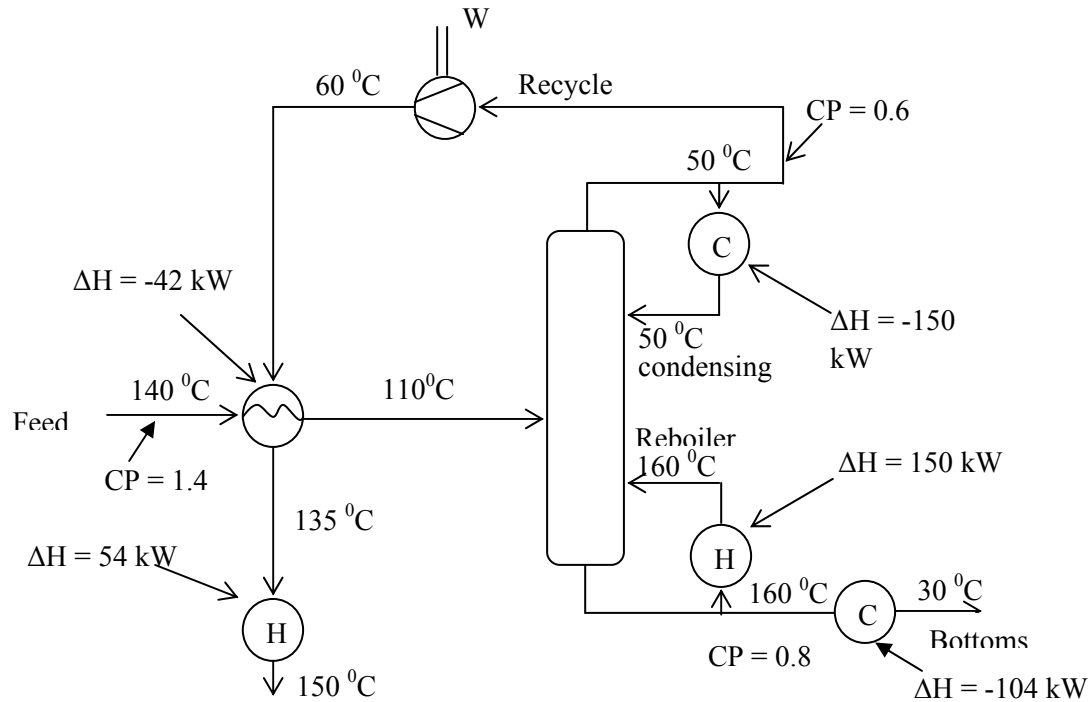


Fig. 1 Process flow diagram for Problem 1

**Solution 1:** The stream data for process shown in Fig. 1 is presented in Table 1.

Table 1 Stream data for Problem 1

Stream	Hot/Cold	$T_S$	$T_T$	$\Delta H$	$CP(=\Delta H/\Delta T)$
		( $^{\circ}\text{C}$ )	( $^{\circ}\text{C}$ )	(kW)	(kW/ $^{\circ}\text{C}$ )
Feed	HOT	140	110	-42	1.4
Bottoms	HOT	160	30	-104	0.8
Condensing	HOT	50	50	-150	$\infty$
Recycle	COLD	60	150	54	0.6
Reboiler	COLD	160	160	150	$\infty$

**Problem 2:** Extract data for hot and cold streams from the process flow sheet shown in Fig. 2.

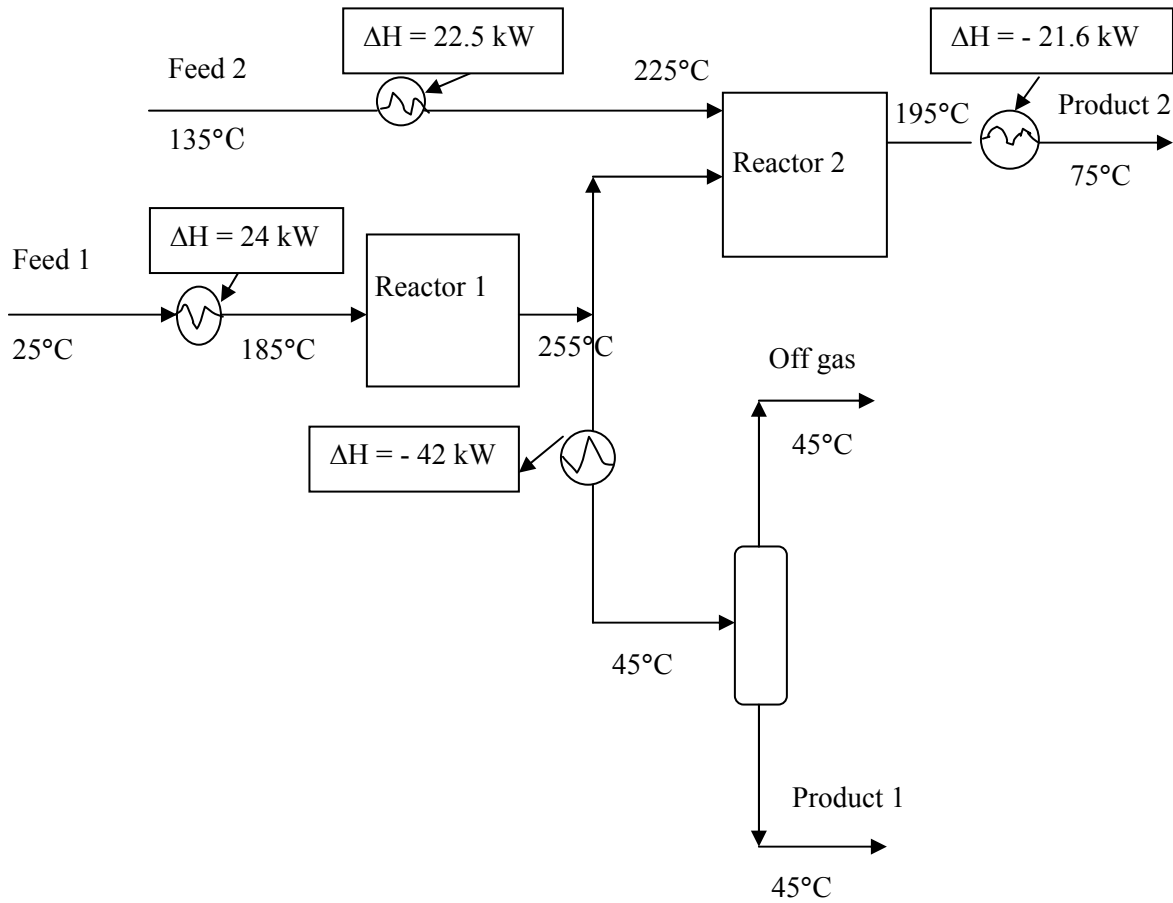


Fig. 2: Process flow diagram for Problem 2

**Solution 2–** The stream data for Problem 2 is shown in Table 2.

Table 2: Stream data for Problem 2

Stream	HOT/COLD	$T_S$	$T_T$	$\Delta H$	$CP(=\Delta H/\Delta T)$
		( $^{\circ}C$ )	( $^{\circ}C$ )	(kW)	(kW/ $^{\circ}C$ )
Reactor 1 feed(feed-1)	COLD	25	185	24	0.15
Reactor 1 product ( product-1)	HOT	255	45	- 42	0.2
Reactor 2 feed(feed-2)	COLD	135	225	22.5	0.25
Reactor 2 product ( product-2)	HOT	195	75	- 21.6	0.18

**Problem 3:** The process flow diagram of a low temperature distillation system is shown in Fig.3. Extract the stream data for this process.

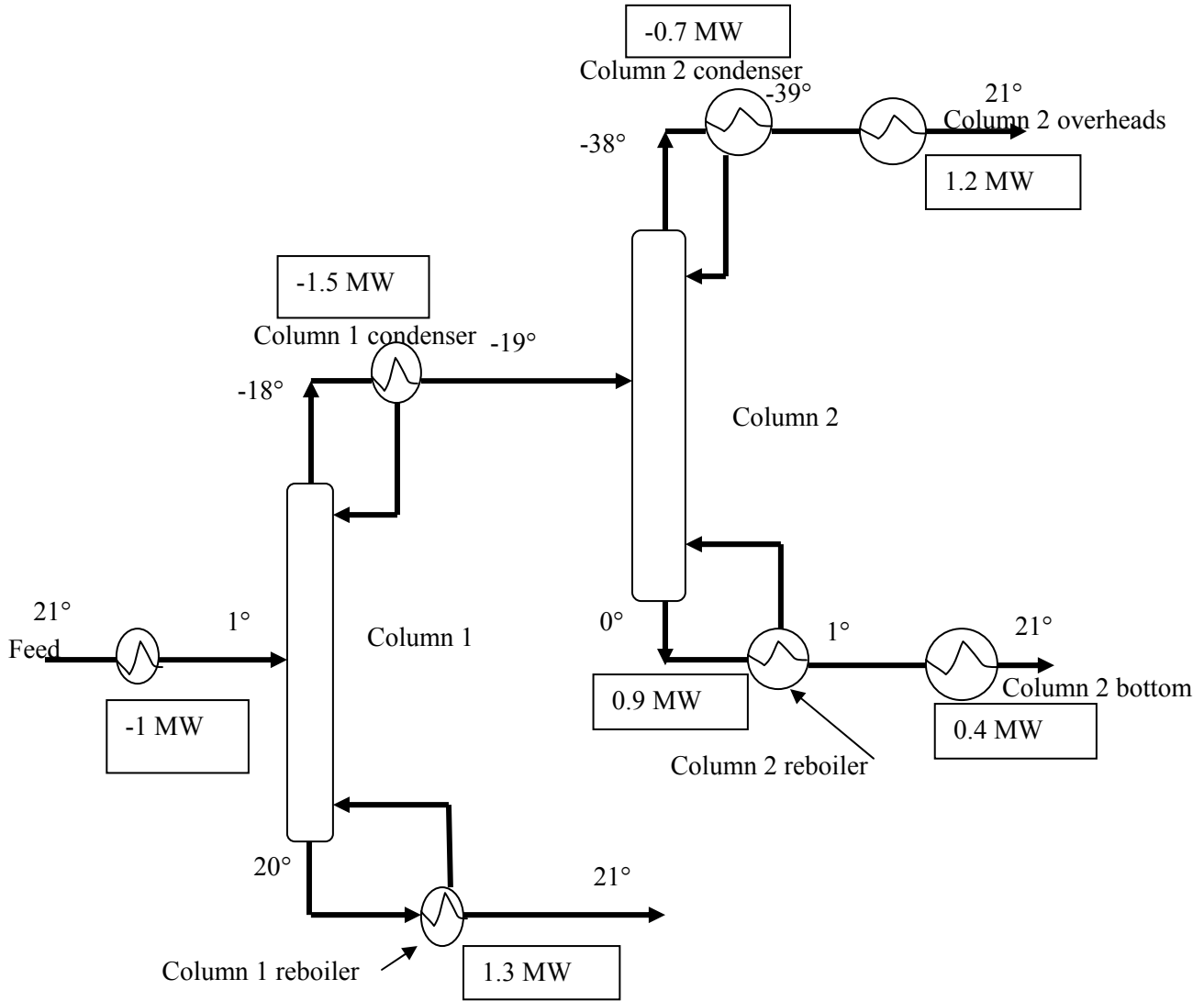


Fig. 3 Process flow diagram for Problem 3

**Solution 3:** The stream data for Problem 3 is presented in Table 3.

Table 3: Stream data for Problem 3

Stream	Hot/Cold	$T_S$	$T_T$	$\Delta H$	$CP(=\Delta H/\Delta T)$
		( $^{\circ}C$ )	( $^{\circ}C$ )	(MW)	(MW/ $^{\circ}C$ )
Feed to column 1	Hot	21	1	- 1	0.05
Column 1 condenser	Hot	-18	-19	- 1.5	1.5
Column 2 condenser	Hot	-38	-39	- 0.7	0.7
Column 1 reboiler	Cold	20	21	1.3	1.3
Column 2 reboiler	Cold	0	1	0.9	0.9
Column 2 bottom	Cold	1	21	0.4	0.02
Column 2 overheads	Cold	-39	21	1.2	0.02