Chemical Process Design / Diseño de Procesos Químicos

Topic 4.5. Splitter

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4.- Development of Linear Mass Balance (LMB) models

### 4.2. Splitter / Divisor

\[ \mu_{ij}^k = \mu_i^k = \mu_{IN}^k \to S \]

\[ \xi_1 \to \mu_{s1}^k \]

\[ \xi_2 \to \mu_{s2}^k \]

\[ j = 1, \ldots, NS. \]

\[ \mu_{S,j}^k = \xi_j \mu_i^k \]

\[ \mu_{S,NS}^k = (1 - \sum_{j=1}^{NS-1} \xi_j) \mu_i^k \]

Need to specify the fraction of each splitter →

1 degree of freedom (d.f.).

\( \xi \) (xi), Split fraction.

Fraction of input stream tearing output stream.

For all k.

If NS = 2

\[ \mu_{S,1}^k = \xi_1 \mu_i^k \]

\[ \mu_{S,2}^k = (1 - \xi_1) \mu_i^k = \xi_2 \mu_i^k \]

For all k.

- This could be a vessel or part of a pipe, i.e.

- The split fraction may have a high impact in the recycle stream to the reactor.